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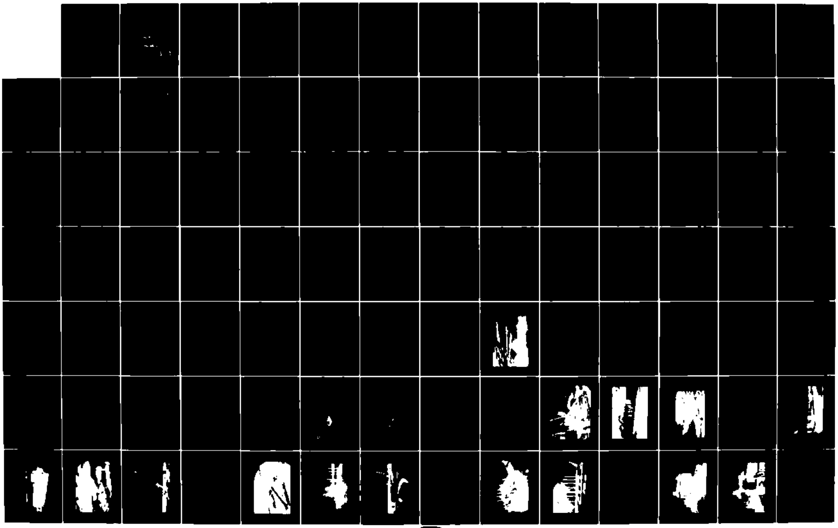

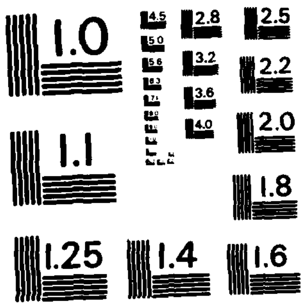

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DEPARTMENT OF DEFENSE

Joint Test Director

Joint Logistics Over-The-Shore II

Test and Evaluation

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JLOTS II Test Design

JANUARY 1983

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DEPARTMENT OF DEFENSE

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January - 1983

Joint Logistics Over-the-Shore II (JLOTS II)

Joint Test Directorate

Naval Amphibious Base, Little Creek

Norfolk, Virginia 23521

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FOREWORD

The Test Design for Joint Logistics Over-The-Shore (JLOTS) II was originally published as a Comment Draft in July 1982. That draft was reviewed by each of the Services and the comments and recommendations forwarded by the Service headquarters to the Joint Test Director have been taken into account in this final issue. The comments received were substantive, but the test scope and objectives have remained unchanged, although rephrased for clarity. The most significant change is in the site for the Throughput Phase. A detailed site survey of the proposed location at Camp Lejeune, North Carolina revealed serious limitations caused by restricted beach area and access, and by shallow water depth in the desired location for the participating vessels. Further analysis of the sea conditions predicted for the test time period revealed that there is a greater probability of experiencing sea state 3 at Fort Story, Virginia than at Camp Lejeune. Fort Story was selected as the site for all phases of the test.

The major support organization for the JLOTS II Test Directorate is the Mobile Support Systems Office, David Taylor Naval Ship Research and Development Center, Annapolis, Maryland 21402. Since the JLOTS II Joint Test Directorate will be disestablished following completion of the project, the Mobile Support Systems Office will thereafter continue to be a source of information concerning the project details and availability of documents developed.

LIST OF ABBREVIATIONS

AABFS	Amphibious Assault Bulk Fuel System
AAFS	Amphibious Assault Fuel System
AAFSF	Amphibious Assault Fuel System Facility
ADP	Automatic Data Processing
AFOE	Assault Follow-On Echelon
ALS	Amphibious Logistic System
AMSS	Advanced Multipurpose Soil Stabilization
ATTF	Amphibious Tanker Terminal Facility
C^3	Command, Control and Communciations
CLQ	Check List Question
CONUS	Continental United States
COTS	Container Offloading and Transfer System
CPF	Causeway Platform Facility
CSS	Combat Service Support
CWR	Calm Water Ramp
DC	Data Collector
DASPS	Department of the Army Standard Port System
DM	Data Manager
DMC	Data Manage
DOD	Department of Defense
EEA	Essential Elements of Analysis
ELCAS	Elevated Causeway
FLS	Field Logistic System
FSSG	Force Service Support Group
FY	Fiscal Year
ISO	International Organization for Standardization

ITO	Installation Transportation Offices
JLOTS	Joint Logistics Over-the-Shore
JTD	Joint Test Director
LACH	Lightweight Amphibious Container Handler
LACV	Lighter Air Cushion Vehicle
LARC	Lighter Amphibious Resupply Cargo
LASH	Lighter Aboard Ship
LCM	Landing Craft, Mechanized
LCU	Landing Craft, Utility
LOTS	Logistics Over-the-Shore
LST	Tank Landing Ship
LTON	Long Ton
MAF	Marine Amphibious Force
MHE	Material Handling Equipment
MILSTAMP	Military Standard Transportation and Movement Procedure
MLTM	Multi-Leg Tanker Mooring
MOMAT	Mobile Matting
MSC	Military Sealift Command
NAVCHAPGRU	Navy Cargo Handling and Port Group
NEPA	National Environmental Policy Act
NSS	Non-Selfsustaining
NTPF	Near Term Prepositioned Force
OBFS	Offshore Bulk Fuel System
OCONUS	Outside Continental United Stated
OSDOC	Offshore Discharge of Containership
PAU	Portable Annotation Unit
PCS	Powered Causeway Section
PHIBCB	Amphibious Construction Battalion

POE	Port of Embarkation
POL	Petroleum Oil Lubricant
PSF	Pounds Per Square Foot
PSI	Pounds Per Square Inch
RDF	Rapid Deployment Force
RDJTF	Rapid Deployment Joint Task Force
ROWPU	Reverse Osmosis Water Purification Unit
RO/RO	Roll-On/Roll-Off
RTCH	Rough Terrain Container Handler
SDC	Senior Data Collector
SPM	Single Point Mooring
STON	Short Ton
TACS	Auxiliary Crane Ship (Civilian Crew)
TCDF	Temporary Container Discharge Facility
TCMD	Transportation Control and Movements Documentation
TD	Technical Director
TEMP	Test and Evaluation Master Plan
TMPT	Tactical Marine Petroleum Terminal

I. INTRODUCTION

BACKGROUND

The evolution of containerships, Roll-On/Roll-Off (RO/RO) ships, and barge ships in the merchant fleet and the necessity to use these ships to deliver military equipment and supplies, including bulk liquid, to littoral areas with little or no means to provide ship offloading facilities has forced the Services to develop a new logistics capability. In essence, the new capability is a surrogate for the standard fixed-port facilities which are normally required for unloading merchant ships and handling large quantities of cargo for sustained operations. The surrogate capability is intended to be employed until a fixed-port facility can be repaired, constructed, or otherwise established in the area of operations.

To satisfy the new logistic support requirement, the Services have developed systems which offer the potential for providing the necessary support wherever needed. For example, facilities have been developed for offloading military equipment and containerized and breakbulk cargo from modern merchant ships offshore and transferring them over-the-shore. Also, systems for transferring bulk fuel from offshore tankers to storage and distribution facilities set up on the beach have been developed and have capacities to supply the early-on need for large volumes of fuel required by the mechanization of modern warfare. The Army system is called Logistics Over-the-Shore (LOTS); the Navy, Amphibious Logistic System (ALS); and the Marine Corps, Field Logistic System (FLS).

Elements of the Service systems have been undergoing evaluation since 1970. Now, with the remaining elements nearing the end of their development, plans must be made to conduct integrated operational testing

of the systems. For a number of reasons, the systems must be tested within the joint test arena. First, the logistic need itself addresses a joint requirement; second, the Service systems are too complex and expensive for individual Service testing; and, third, Service component testing alone will not generate, for operational testing, those situations which will occur when the Service systems interact during an operational scenario.

The joint testing of the systems began with exercises in 1970 which tested early concepts for discharging containers from a self-sustaining containership using an onboard gantry crane and helicopters. Further containership testing was done in 1972, and then the first major series of joint tests, called Joint Logistics Over-the-Shore (JLOTS) I, was conducted at Fort Story, Virginia during the period 1976-1977.

The purpose of JLOTS I was to provide an early assessment of the Service capabilities to deploy equipment and to handle a containership, barge ship, and breakbulk ship and the cargo they deliver in an over-the-shore environment. The tests showed that container operations in an over-the-shore situation were possible, but that significant problems involving shipside discharge, lighterage, shoreside delivery and container handling remained to be solved, particularly with regard to weather conditions which were more severe than sea state 1. Unfortunately (for test purposes), weather conditions during the tests were generally classified as calm.

PURPOSE

Whereas JLOTS I was able to test only parts of Service over-the-shore logistics systems (due primarily to incomplete development), JLOTS II will be a complete-system test and will test the operational delivery of military equipment and supplies arriving on merchant ships in a

representative austere environment under, hopefully, weather conditions up to and including sea state 3. The test results will provide information which can be used to validate or refine operational techniques, planning factors, and equipment requirements and to assist in determining deployment force structure and sealift requirements. Overall, JLOTS II will provide the Services, individually and collectively, with an awareness of the problems to be faced in moving military cargo to and across a shoreline which is essentially without the minimum port facilities required for the normal peace-time unloading of modern ships.

SCOPE

JLOTS II, initiated on 14 December 1981, consists of three phases. Phase I, Deployment, is scheduled for the fourth quarter of Fiscal Year (FY) 1983 and addresses the merchant ship deployment of military equipment required to conduct LOTS operations. Selected equipment will be loaded on candidate merchant ships, transported to an anchorage off Fort Story, Virginia and discharged into appropriate waterborne systems. The Deployment Phase is completed when all equipment has been ship offloaded and transported ashore. Phase II, Roll-On/Roll-Off operations, will be conducted in the first quarter of FY 84. Selected Army and Marine Corps vehicles will be offloaded from two RO/RO ship configurations onto the RO/RO offloading facility and transported ashore at Fort Story on lighterage. Phase III, Throughput, will evaluate the sustained discharge of breakbulk and container cargo as well as the operation of bulk POL systems off of Fort Story. This test commences with the equipment in the configuration it was in when the Deployment Phase ended, that is, with the ALS/FLS/LOTS equipment assumed to have been discharged from commercial ships and transported ashore. Thus, the Throughput Test will include the installation, operation, and selected retrieval of this equipment.

Transition from a Navy ALS/Marine Corps FLS operation to an Army LOTS operation will occur during the Throughput Tests. Additionally, during Phase III a barge mounted Reverse Osmosis Water Purification Unit (ROWPU), designed to produce potable water from sea water, will be placed in operation at Fort Story if the prototype is available. The schedule of major events in the three JLOTS test phases is summarized in Figure 1.

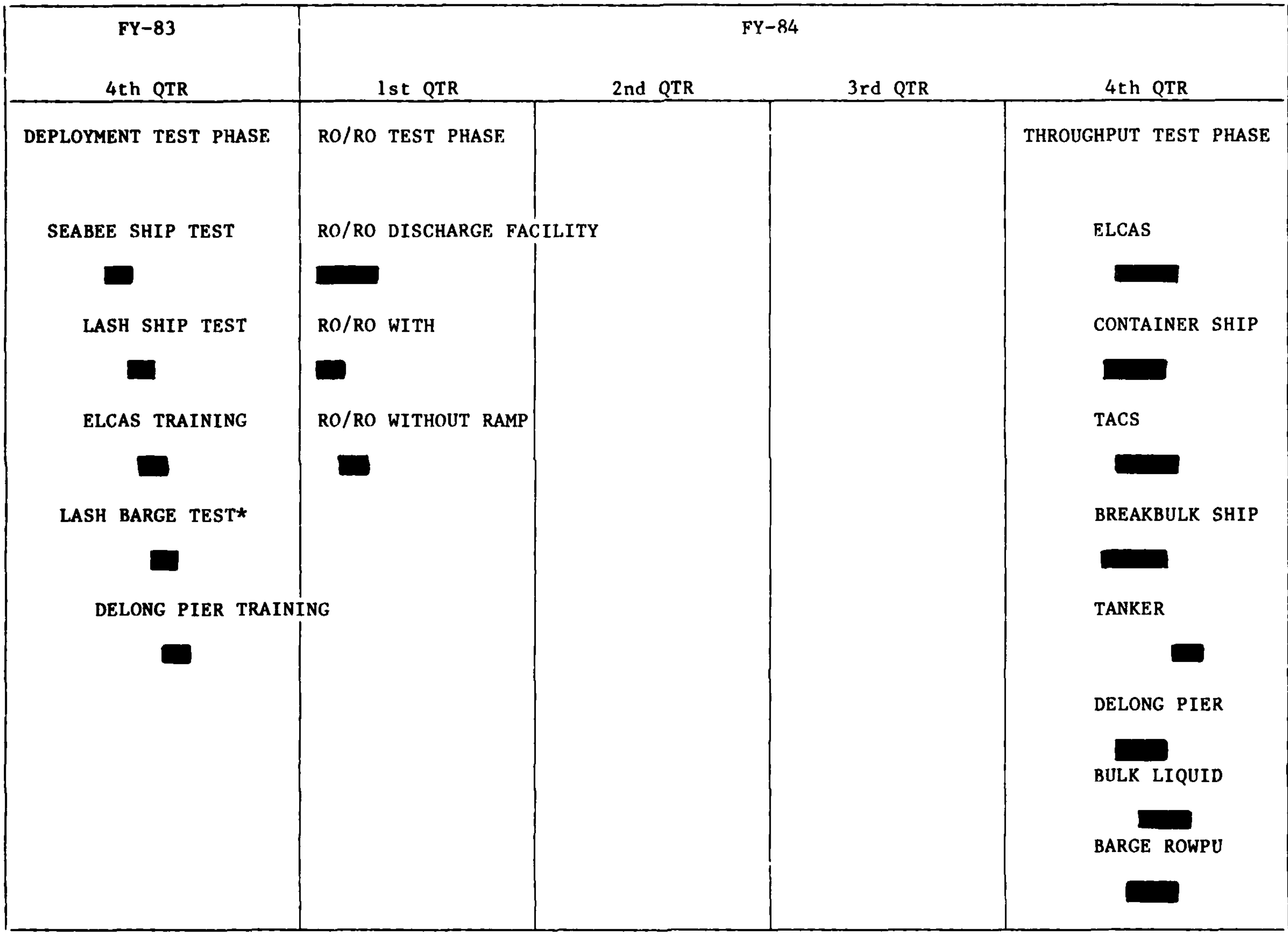
The commercial ships which must be chartered to accomplish the test operations of JLOTS II represent the dominant costs of the required test resources. Eight ship types, selected to satisfy the test objectives, consist of the following: non-selfsustaining (NSS) containership, Lighter Aboard Ship (LASH), SEABEE, RO/RO with ramp, RO/RO without ramp, breakbulk ship, tanker, and Auxiliary Crane Ship (TACS).

The test issues, which drive the breadth and depth of the test activities, are encompassed in five major objectives detailed in Section II.

TEST DOCUMENTATION

The JLOTS II Test Design is the primary document stating the overall precept for the total test and evaluation. It expands the test concept sufficiently to give specific guidance to both operational and evaluation planners. The Test Design includes overall descriptions, operations, sequences and time lines and identifies major systems required. It also includes an expanded test concept, objectives, subobjectives, and analysis/evaluation guidance.

Field Test Plans will be prepared for each phase of JLOTS II (Deployment, RO/RO, and Throughput). These documents form the basis for specific operational planning to address applicable objectives and subobjectives. They identify Service and organizational areas of responsibility and the general level of participation required for both



*LASH Barge unloading test is part of the Cargo Throughput Test but is scheduled for economy reasons to take place during Deployment Test Phase.

Figure 1 - Schedule of Major Events

functional and support activities, including materiel and base support. Test cargo, ship charter requirements, and details regarding sequences of events are examples of items addressed in field test plans.

Operational Orders (OPORDERS) supporting the field test plans will be prepared by the participating units. OPORDERS will provide detailed plans for participation of military units and coordinating instructions and responsibilities. Detailed operating schedules will also be included. These documents will be Service responsibilities, with assignment made according to a distribution of responsibility or level of test participation. OPORDERS will be prepared for each major segment of the test. For example, there will be one OPORDER for the LASH ship deployment test, and another for the SEABEE ship deployment test.

A Data Management Plan will be prepared for each phase of JLOTS II, defining the approach and scope of data management. There will be three major sections in each data management plan:

Data Element Requirements will provide the detailed data element descriptions and define their relationship to the test objectives, subobjectives, and evaluation criteria in the Test Design. They will document the structured breakdown of objectives into subobjectives, essential elements of analysis, and data elements.

Data Collection will define data checklist questions and data collection forms. It will identify procedures and manpower requirements for data collection, and support requirements for data collectors.

Data Reduction, Storage, Retrieval and Distribution identifies procedures and responsibilities for consolidation, retrieval, maintenance, and dissemination of test data.

An overall JLOTS II Analysis and Evaluation Concept will identify analysis requirements, as well as the procedures for testing the validity of test data and for developing the conclusions and recommendations relating to the JLOTS II objectives. It will define the methodology for evaluation through the logic structure from data elements to objectives.

Two Reports will be prepared for each test phase; a Quick Look Report and, a Phase Report. A quick look report will be prepared immediately following completion of each test phase, giving general accomplishments. Each phase report will cover the findings of the test conducted in that phase and will provide conclusions for the specific objective(s) addressed.

A final Summary Report will provide the overall results, conclusions, and recommendations of the JLOTS II joint test and evaluation. It will cover the summary assessment of the Services' capability to conduct ALS/FLS and LOTS operations including the transition or joint operations.

A Lessons Learned Report at the conclusion of the test will provide guidance and useful planning information for future employment of JLOTS systems from the perspective of the Joint Test Director.

II. JOINT TEST OBJECTIVES

OBJECTIVE 1

Assess the capability to deploy on designated commercial ships selected outsize military equipment needed to conduct over-the-shore operations.

Subobjective 1.1

Evaluate the deployment of selected JLOTS equipment on a LASH ship.

Subobjective 1.2

Evaluate the deployment of selected JLOTS equipment on a SEABEE ship.

Subobjective 1.3

Evaluate the deployment of the Offshore Bulk Fuel System (OBFS) on a breakbulk ship.

OBJECTIVE 2

Assess the installation and preparation of over-the-shore systems and equipment for cargo operations.

Subobjective 2.1

Evaluate the installation of the Navy calm water RO/RO ship offloading facility on ships with integral ramps.

Subobjective 2.2

Evaluate the installation of the Navy Calm Water RO/RO ship offloading facility on ships without integral ramps.

Subobjective 2.3

Evaluate the preparation of the Navy Auxiliary Crane Ship (TACS) for container ship offloading operations.

Subobjective 2.4

Evaluate the installation of the Navy Elevated Causeway (ELCAS) systems.

Subobjective 2.5

Evaluate the installation of the Navy Amphibious Assault Fuel Supply Facility (AAFSF).

Subobjective 2.6

Evaluate the installation of the Navy Amphibious Tanker Terminal Facility (ATTF).

Subobjective 2.7

Evaluate the preparation of the Army Temporary Container Discharge Facility (TCDF).

Subobjective 2.8

Evaluate the installation of the Army "A" DeLong Pier facility.

Subobjective 2.9

Evaluate the installation of the Army Tactical Marine Petroleum Terminal (TMPT).

Subobjective 2.10

Evaluate the installation of the Army Standard Port System (DASPS).

Subobjective 2.11

Evaluate the installation of the USMC Amphibious Assault Fuel System (AAFS).

Subobjective 2.12

Evaluate the preparation of beach and marshaling areas for over-the-shore cargo operations.

OBJECTIVE 3

Assess the over-the-shore systems and equipment capabilities for sustained container, breakbulk, vehicle and bulk POL systems operations.

Subobjective 3.1

Evaluate the capability of the RO/RO offloading facility to discharge

vehicle cargo from RO/RO ships with integral ramps in calm water operations.

Subobjective 3.2

Evaluate the capability of the RO/RO offloading facility to discharge vehicle cargo from RO/RO ships without integral ramps in calm water operations.

Subobjective 3.3

Evaluate the capability of the TACS to offload container ships in sea states 0-3.

Subobjective 3.4

Evaluate Navy Amphibious Logistics System (ALS) capability to conduct sustained breakbulk and cargo throughput operations.

Subobjective 3.5

Evaluate the Army Logistics Over-the-Shore (LOTS) capability to conduct sustained breakbulk and container cargo throughput operations.

Subobjective 3.6

Evaluate the USMC Field Logistics System (FLS) capability to support sustained breakbulk and container cargo throughput operations.

Subobjective 3.7

Evaluate the joint capability of Services' systems and equipment to conduct sustained breakbulk and container cargo throughput operations.

Subobjective 3.8

Evaluate the capability of Services' to discharge cargo from LASH barges.

Subobjective 3.9

Evaluate the capability to discharge cargo from Seasheds on board the TACS ship.

Subobjective 3.10

Evaluate the capability of Navy/USMC systems to transfer bulk POL products from offshore commercial tanker vessels to shore storage facilities.

Subobjective 3.11

Evaluate the capability of the Army systems to transfer bulk POL products from offshore commercial tanker vessels to shore storage facilities.

OBJECTIVE 4

Assess the capabilities of the Services' to manage and control the movement of container and breakbulk cargo in sustained throughput operations over-the-shore.

Subobjective 4.1

Assess the Army DASPS in sustained cargo throughput operations over-the-shore.

Subobjective 4.2

Evaluate the USMC cargo documentation and control system in sustained cargo throughput operations over-the-shore.

OBJECTIVE 5

Assess the capability of the Services' to transition from a Navy ALS/Marine Corps FLS operation to an Army LOTS operation.

Subobjective 5.1

Evaluate the procedures, systems, and equipment requirements necessary to support the transition from Navy to Army over-the-shore operations.

Subobjective 5.2

Evaluate the joint operation of systems and equipment during the transition from Navy to Army over-the-shore operations.

III. TEST CONCEPT

GENERAL

The purpose of JLOTS II is to determine Service capability to deliver equipment and supplies to forces ashore operating in areas where port faciities do not exist or are inadequate. The equipment and supplies will be carried as container, breakbulk, RO/RO, and bulk liquid cargo. The test will identify selected commercial sealift requirements to deploy an over-the-shore cargo discharge system, and test data may be used to determine planning factors for equipment installation and cargo throughput.

The concept for test and evaluation operations in JLOTS II utilizes a three-phased approach. The first phase is titled "Deployment Phase" and it examines ship load-out and off-shore discharge procedures for selected major items of Service equipment such as high density and heavy and/or outsized equipment. The second phase, the "RO/RO Phase", tests the offloading of military vehicles from RO/RO ships anchored offshore. The effectiveness of the installation and operation of the Navy's new RO/RO drive-off facilities will be evaluated. The third phase called the "Throughput Phase" exercises equipment and personnel in the JLOTS operation from which installation times and cargo throughput results will be gathered for each respective cargo handling system. This last phase will also examine the transition which would occur when the Navy ALS/Marine Corps FLS operation evolves into an Army LOTS operation. All JLOTS II tests will be conducted at Fort Story, Virginia.

The three-phased approach was selected to minimize test demands upon shipping, personnel, and other resources which would be required for a

full-scale JLOTS deployment and exercise. However the success of this approach hinges on the careful selection and availability of ships, equipment, and trained personnel, as well as on a precise and comprehensive data collection and analysis effort.

Although ship, lighterage, and shore-side components included in the Throughput Phase must be integrated and evaluated as a total system, each element will require individual examination showing cyclic distributions. Thus data collection must be adequate and of sufficient depth to identify delays, queuing, or other problem areas. The results should point to any problems with hardware configuration, management procedures, unit organization, training shortfalls, or the like. Factors by which equipment, facilities, and units will be evaluated are called essential elements of analysis (EEAs) and are described in Section VI.

TEST SCOPE

Deployment, Phase I

A major goal of this phase is to assist in evaluating certain commercial and MSC assets which could be used to deploy equipment required to conduct over-the-shore operations. Specifically, it will provide a means to evaluate capabilities for the in-port load-out, transport, offshore discharge, and movement-to-shore of major JLOTS equipment components needed for ship-to-shore cargo throughput operations. Shipboard retrieval of selected JLOTS equipment will also be tested.

The deployment tests will be conducted in FY 83 and will be complete when all JLOTS equipment is ship offloaded in the objective area and transported ashore. This same equipment will be administratively delivered to the Fort Story test site in FY 84 and shoreside installation will be accomplished during the Throughput Phase.

Deployment operations will be limited with respect to equipment, unit availabilities, and time frames for staging, loading, and offloading. The FY 83 deployment test will be developed around use of the LASH and SEABEE ships. These tests are not necessarily planned as concurrent events because of limited personnel and equipment resources. The schedule of Figure 2 summarizes the time phasing of the Deployment test.

In-port loading operations will likely be accomplished by commercial stevedores with military personnel providing direction for specific handling procedures. However, objective area discharge operations must be performed by military personnel who would normally be available for offloading Service cargo.

Data collection will focus on attainment of major control and decision points, timing and procedures for movements, loading and discharge activities, resources, shortfalls, physical characteristics, failures, discrepancies, and other factors necessary to support the test evaluation. The data should be available for reconstruction of any major event.

Selected equipment from the Army, Navy, and Marine Corps will be embarked aboard LASH and SEABEE ships to test techniques, validate planning factors, and verify utility and availability of special handling and securing equipment and other deployment hardware.

RO/RO, Phase II

RO/RO operations are expected to constitute a significant throughput requirement in a contingency. Accordingly, Phase II of this test will involve RO/RO operations using two RO/RO ship configurations, one with an offloading ramp and one without. The RO/RO tests are scheduled separately from the container throughput tests because of common components which must be shared in the time period of the tests by the RO/RO offload facility and the ELCAS. The RO/RO test cargo will be a representative mix of military

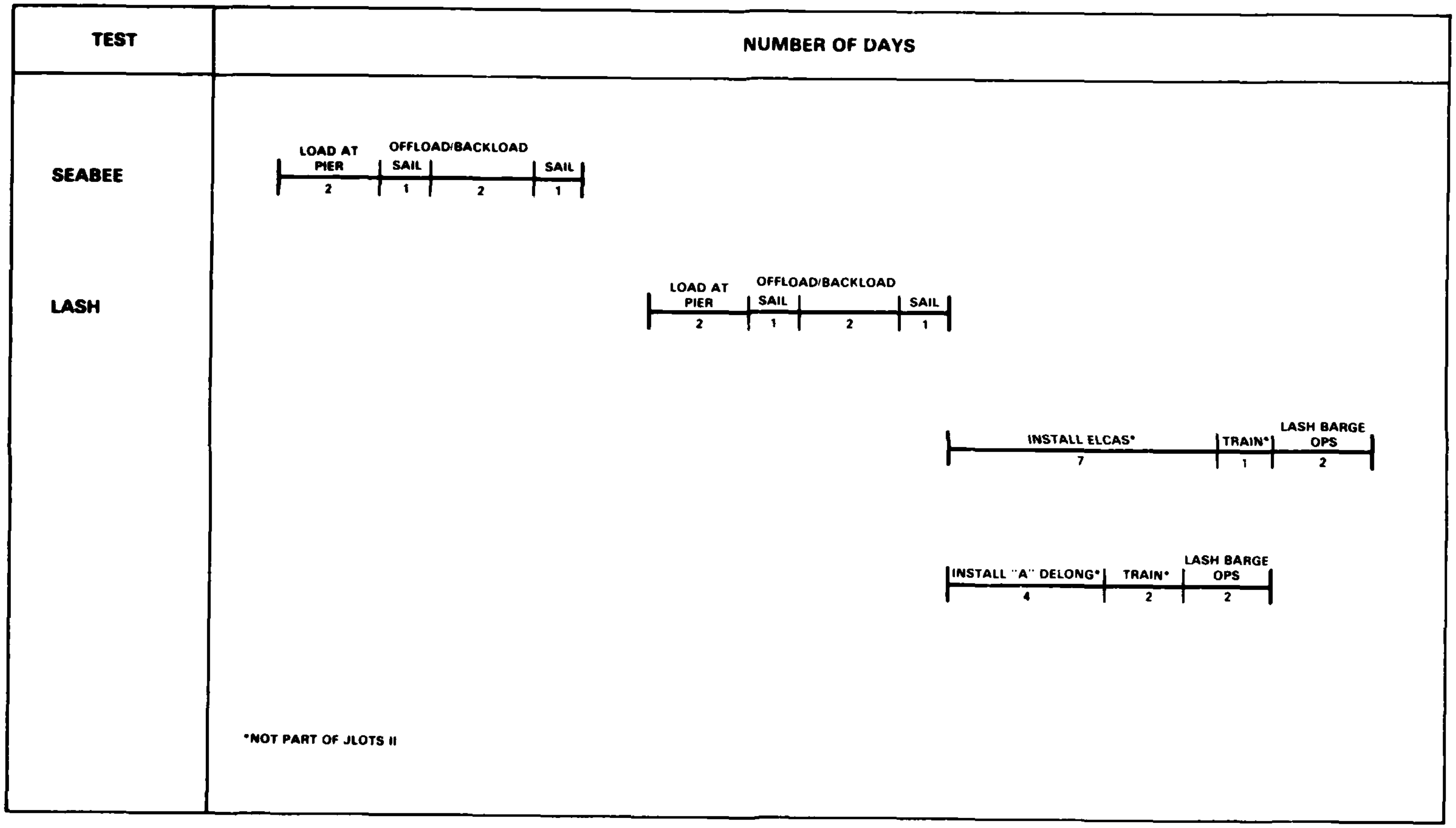


Figure 2 - Deployment Test, Fourth Quarter Fiscal Year 1983

wheeled and tracked vehicles. The test will take place off Fort Story in accordance with the time schedule shown in Figure 3.

Throughput, Phase III

The overall goal of this phase is to determine cargo throughput planning factors in terms of manpower, equipment, force structure, time, and delivery rates for over-the-shore movement of cargo from modern merchant vessels. Basically, five operational areas will be evaluated.

- Ship-cargo transfer system
- Lighterage
- Shore-side transfer system
- Beach staging and clearance system
- Systems management

The container and breakbulk throughput operations will be done at the same time to test the Service's capability to perform concurrent operations. Each Service will operate its own system of lighters, cranes (except the TACS which will be civilian crewed for JLOTS II), tractor-trailers, and other Material Handling Equipment (MHE) such as Lightweight Amphibious Container Handlers (LACHs), front-loaders, and forklifts. Additionally, during this phase the bulk POL systems will be installed and operated. Fresh water will be used in place of fuel in this test in order to minimize the environmental impact. If the initial prototype is available, the Army developed barge mounted Reverse Osmosis Water Purification Unit (ROWPU) will also be operated as a potable water source. Because of ship charter limitations, operations will be confined to about three-weeks with a four-day transition period at the charter midpoint. The Throughput Test time schedule is shown in Figure 4.

The test of the Services' Offshore Bulk Fuel Systems will be conducted after the completion of the Navy/Marine Corps Throughput Test to minimize

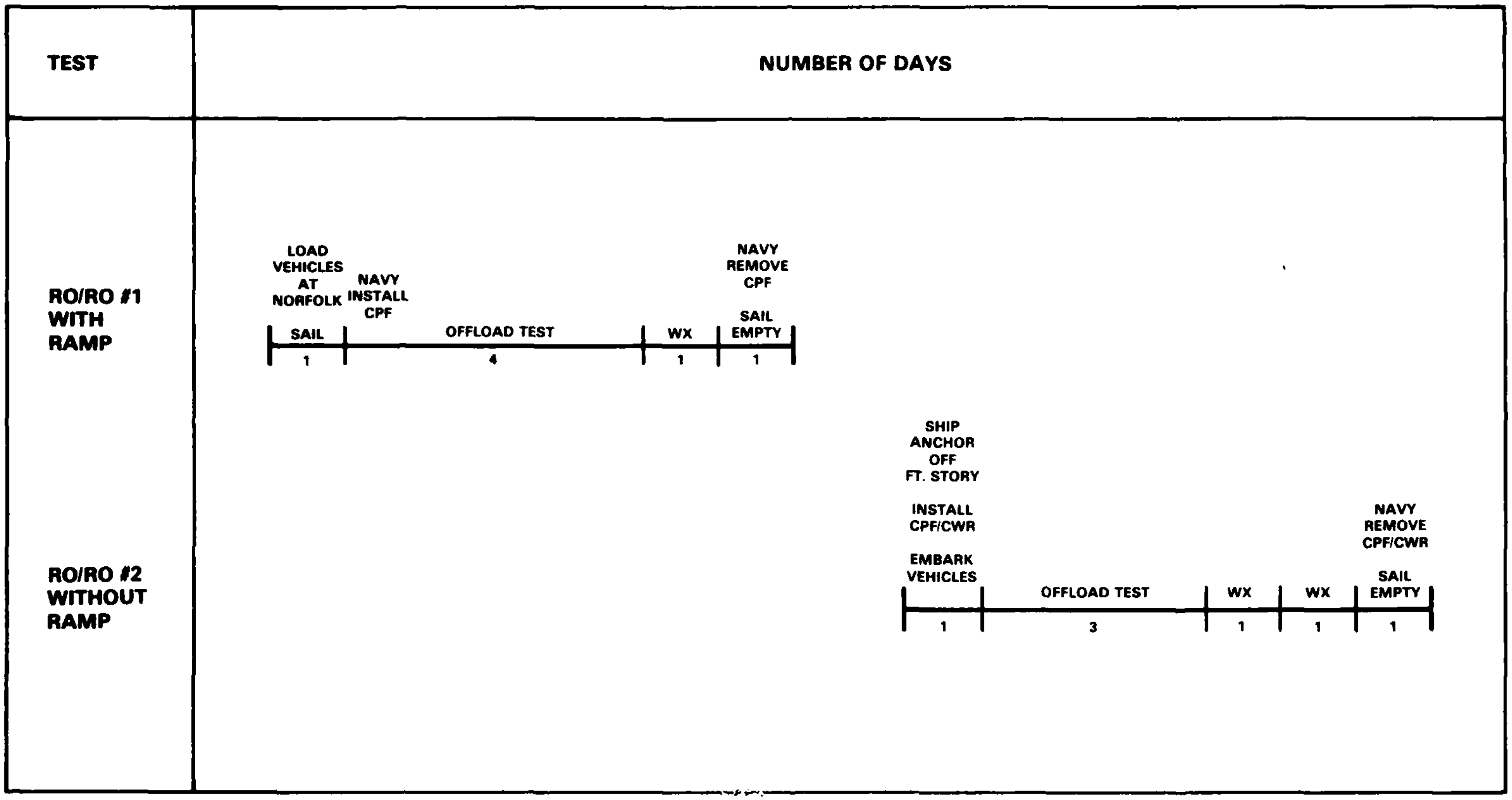


Figure 3 - RO/RO Test, Fourth Quarter Fiscal Year 1983

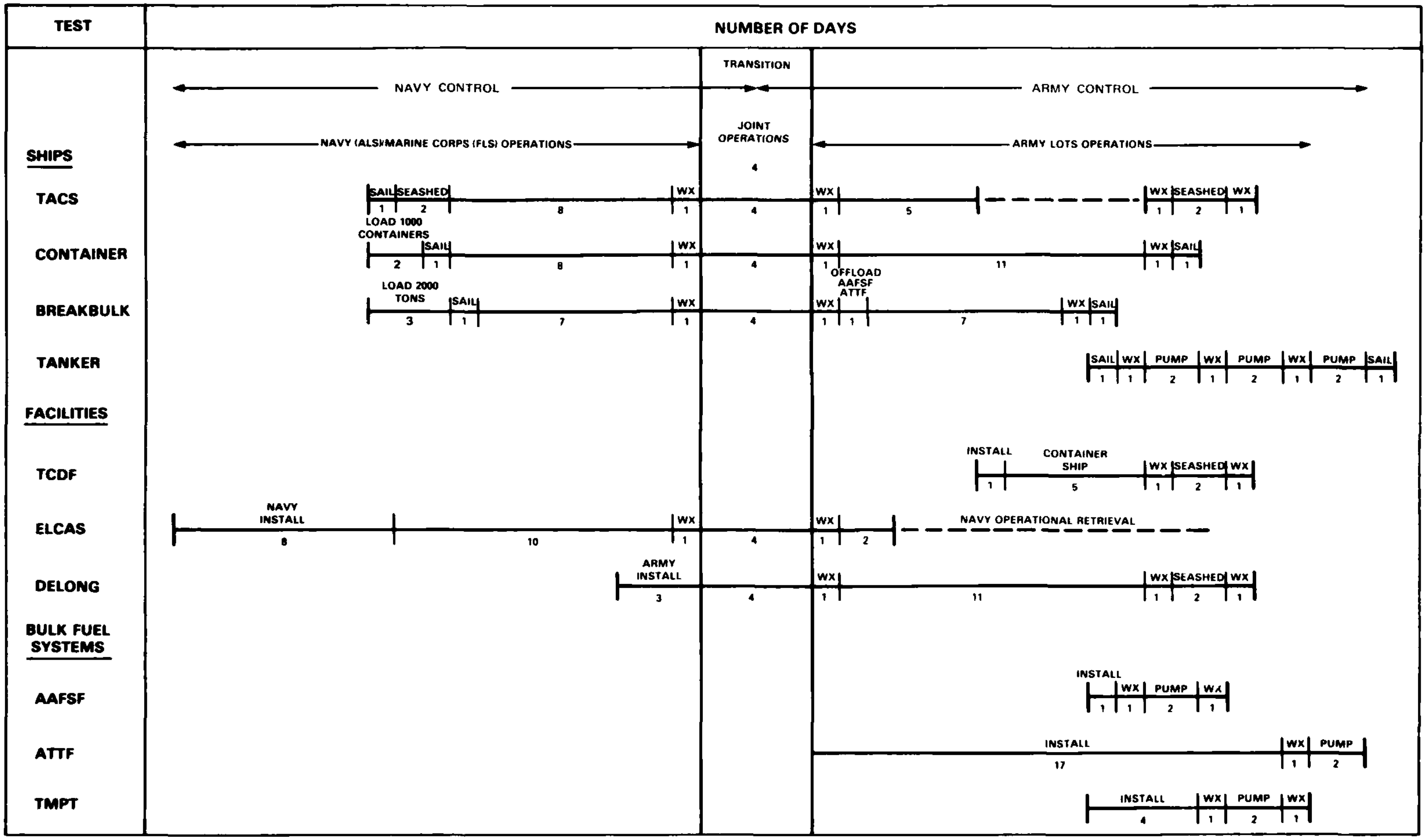


Figure 4 - Throughput Test, Fourth Quarter Fiscal Year 1984

the burden on their manpower/equipment resources. These systems will be set up so that a tanker can exercise each in sequence in order to minimize the charter period.

In all cases where military cargo is to be loaded aboard merchant ships, Military Standard Transportation and Movement Procedure (MILSTAMP) requirements will be followed to include normal offering of cargo through Installation Transportation Offices (ITO) as well as utilization of Transportation Control and Movements Documentation (TCMD) submissions. These procedures will be modified as necessary to accommodate the conditions present in an artificial test as opposed to procedures normally exercised through the process of alert, staging and assembly, offering of cargo, load-out, and sailing and will be followed to the maximum extent possible. Cargo documentation and reports required by MILSTAMP will be followed.

TEST CARGO (Throughput Phase)

The weight distribution of the 1000 twenty foot containers scheduled for the Throughput Phase will be designed to simulate the spectrum of loads in a typical resupply operation.

In addition to the twenty foot containers cited, approximately 20 forty foot containers will be included in the Phase III or Throughput Test. For these containers an average weight of 20 to 35 STons is planned.

Concurrent with container operations, approximately 2000 STon of breakbulk cargo will be discharged to provide realistic over-the-shore handling and management requirements. This is necessary because not all cargo can be containerized or shipped on container vessels. In addition, the breakbulk operation (representative of traditional cargo operations) will provide a baseline against which other cargo handling systems can be compared.

In addition to the above types of cargo, two LASH barges will be loaded with breakbulk and vehicular cargo. This cargo will be used to provide cargo at the beach discharge sites. Also, breakbulk cargo including vehicles and outsized equipment will be stowed in Seasheds aboard the TACS vessel. This cargo will be offloaded by the TACS cranes prior to containership operations. Additionally, the Army will use the Barge TCDF to unload the Seasheds in order to evaluate the compatibility between the TCDF and Seasheds.

OPERATIONAL SCHEDULING

For operations in all phases, test scheduling will depend upon ship availability. Prior test experience has indicated that even when a relatively firm date is established, ships may still be delayed a day or two by weather, maintenance difficulties, port scheduling, and the like. Thus, test operations need to be sufficiently flexible to allow for ship scheduling and other major changes.

TEST DESCRIPTION

Deployment Phase

Figure 2 shows a series scheduling of the LASH and SEABEE ships for the Deployment Phase test events. This is desirable since an overlap of ship schedules could exceed the limits of personnel and equipment resources to support these events.

A movement order will be issued and deploying units will exercise their normal movement plans. The deployment phase will be complete when the ships offload all of the JLOTS equipment in the objective area and transport it ashore or position the equipment (e.g. the TCDF) in an operational mode. Subsequent installation and initial operation of the ELCAS and other equipment will be at the discretion of the Services and will be for unit training only and not part of JLOTS objectives.

Throughput offloading of the mixed cargo on LASH barges is planned to take place at the end of the deployment phase at Fort Story and after completion of Service training on the ELCAS. The loaded barges will be transported aboard the LASH ship and will be moored at the test site until throughput offloading begins.

Since the installation test of the major systems will occur in the Throughput Phase, the data and analysis approach must accommodate the time discontinuity between the system offload in FY 83 and the system installation in FY 84.

RO/RO Phase

The RO/RO ship offloading test can be done independently of the other cargo throughput facilities by use of the RO/RO discharge facility in combination with causeway ferries and other lighterage to carry the vehicles to the beach. Since procurement limitations at the time of the test require the RO/RO discharge facility to share causeway sections with the ELCAS, the RO/RO Test will be scheduled after the Deployment Test to avoid equipment conflicts. The assembly of the discharge facility, in addition to its operation, will be evaluated. Test cargo, consisting of a representative mix of approximately 100 military vehicles, will be offloaded and retrograded in order to develop valid data samples for wheeled and tracked vehicles.

Throughput Phase

The Throughput Test commences where the Deployment Test ended. The ALS, FLS, and LOTS equipment, assumed to have been discharged from commercial ships, will be administratively delivered to the test site and the test will begin with installation and preparation for cargo throughput operations.

The TACS will offload its own test cargo, consisting primarily of support equipment, before commencing offloading operations with the containership. Part of the TACS cargo will be loaded in Seasheds below decks and part of it may be containerized. All discharge operations will be timed and other data will be collected to evaluate productivity.

The containership will embark approximately 1000 twenty foot containers and up to 20 forty-foot containers. The containers will be loaded with dummy cargo. However, the Services may elect to load a select number of containers with real cargo in lieu of dummy cargo to test damage potential during typical LOTS operations. The TACS will offload and retrograde the containers as quickly as conditions permit. Navy/Marine Corps container operations should be planned so that the container ship will be fully loaded when the Army assumes control of the operation. At the completion of the Army throughput operations, all containers will be offloaded into the marshaling yard in preparation for returning all cargo to origin points and releasing the containers back to normal use. The two Army TCDFs (B-DeLong barges each mounted with a 300-ton crane) will be utilized during a portion of the Army LOTS operations.

The breakbulk ship offloading, using its own booms, will occur simultaneously with the containership offloading. The breakbulk ship and the TACS will be used to transport the Navy bulk POL systems and approximately 2000 STons of breakbulk cargo. An alternate deployment of the Navy POL systems is to offload them off Fort Story from the ship selected to transport them to Norfolk from the West Coast. The TMPT is stored at Fort Story.

The last over-the-shore systems to be evaluated are the bulk POL systems. Assembly of the liquid system equipment and hookup to a tanker are important readiness factors to be evaluated. The Army will install its

Tactical Marine Petroleum Terminal (TMPT) and the Navy will install both the Amphibious Assault Fuel Supply Facility (AAFSF) and the Amphibious Tanker Terminal Facility (ATTF). Installation personnel and support equipment to install the fuel facilities are also involved in the installation of the ELCAS and in the preparation of the beach and marshaling areas. In Figure 4, installation activities have been scheduled, where practical, to minimize overlapping usage of personnel and equipment resources.

Fresh water will be pumped from the tanker through the several fuel systems to the beach for storage in bulk facilities. A tanker will be available for about eight days during which hookup, pumping, and line clearing of all three fuel systems will be tested. After filling the individual beach storage facilities, pumping will be continued by rigging the transfer systems into a "closed loop". The second pipeline of both the TMPT and the ATTF may be required in order to recirculate the water back to the tanker, thus allowing continuous pumping in order to test the systems under sustained conditions.

The final JLOTS test objective is to assess Service capabilities to transition from a Navy/Marine Corps logistic support operation to an Army directed operation. In a representative contingency situation, the Navy/Marine Corps system would provide the initial commercial ship unloading capability and would deliver not only the follow-on supplies and equipment of the amphibious assault forces, but also the necessary sustained support. Upon arrival of the Army forces, while the Army LOTS system is being established, dual operations would be conducted under Navy control until such time that the Army is fully established and Navy systems begin to withdraw, if required, to support other contingency operations. Control would then shift to the Army using an agreed phased procedure.

Early in the transition period, the Navy, Marine Corps, and Army will operate concurrently under Navy control as the Army sets up and begins operating its LOTS system. When mutually agreed and when the majority the Army systems are operational, control will shift to the Army. In any event, the theater commander of the deployed forces would designate those service provided systems and forces which must be retained in place in order to satisfy daily tonnage requirements. In the case of JLOTS II, the Joint Test Director will act in this capacity. In reality, the limited amount of over-the-shore equipment owned by the individual Services would most likely dictate mutual deployment operations of specialized equipment such as the TACS, fuel systems, ELCAS, and Delong Piers.

Specific JLOTS II procedures will be identified in order to evaluate the capabilities of the Services to transition from a Navy/Marine Corps ALS/FLS operation to an Army LOTS operation. These procedures are summarized in Section IV, Test Schedules.

IV. TEST SCHEDULES AND OPERATIONS

DEPLOYMENT TEST SCHEDULE

Figure 5 shows the detailed test events schedule of the JLOTS II Deployment Phase. The ship offloading tests can be completed in 12 calendar days if the SEABEE and LASH ships can be scheduled in sequence.

The SEABEE loadout will include the largest of the equipment items, many of which cannot be loaded aboard the LASH ship. The LASH loadout will include two LASH barges, preloaded with breakbulk and vehicular cargo, for the barge Throughput Test to be conducted at the end of the Deployment Phase.

After pierside loadout in Norfolk, the SEABEE ship and later the LASH ship, will sail to Fort Story, drop anchor offshore, and commence offloading operations. In order to test the offshore onload operations, a few outsized items will be backloaded onto the ships and offloaded again prior to their transit ashore. Since some of the items offloaded from the SEABEE ship may subsequently be carried aboard the LASH ship, the Services may be required to transport them back to Norfolk for onloading. Upon completion of the offload tests, the ships will sail from the test site empty.

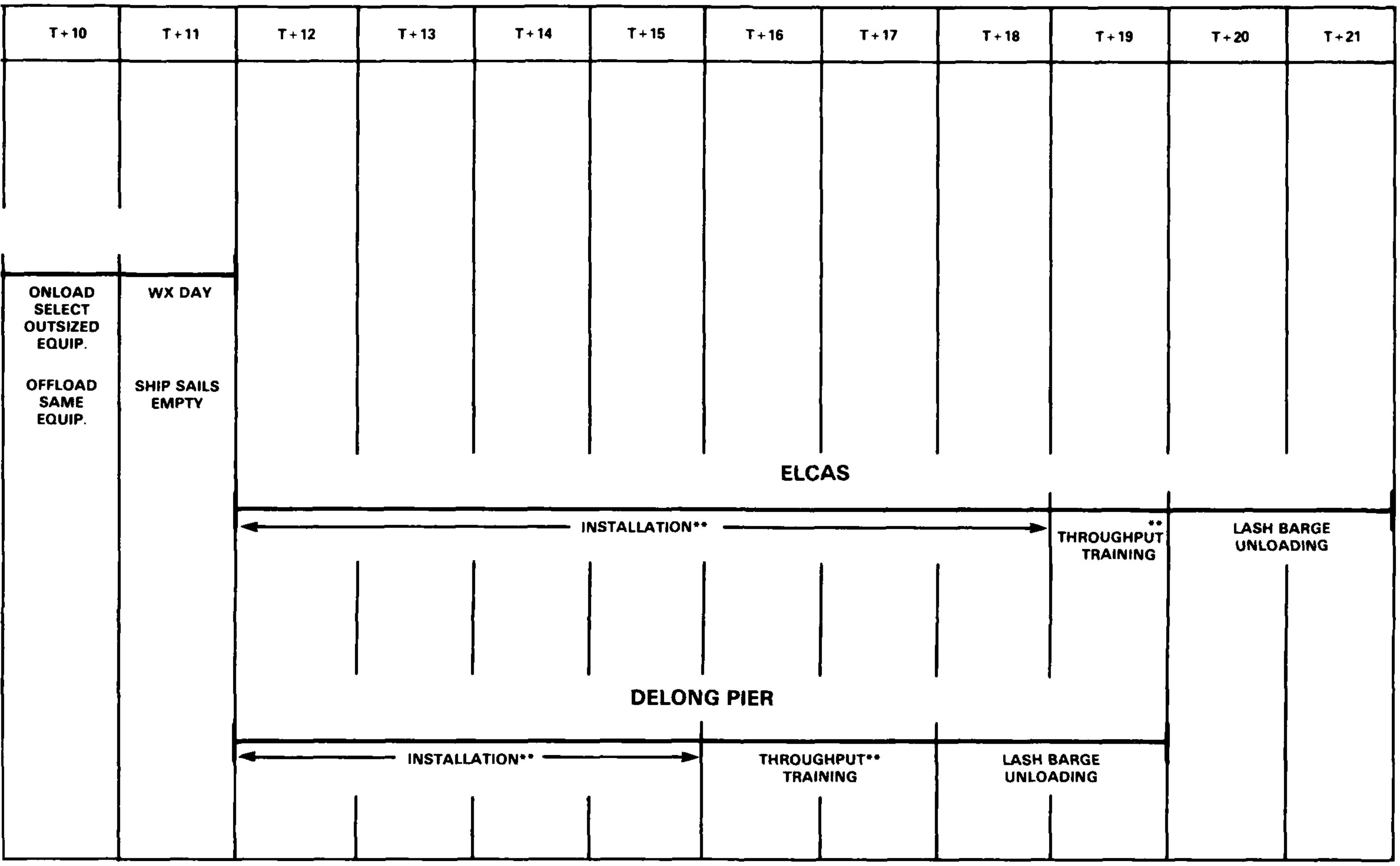
RO/RO TEST SCHEDULE

Figure 6 shows the detailed day-to-day test events schedule of the RO/RO tests at Fort Story. The total test time is 14 days. The test will be conducted after the Deployment Test, and will be scheduled no later than October 1983 to preclude test delays resulting from deteriorating weather which is likely to occur from mid-November through December. A test cargo of 100 vehicles will alternately be loaded and offloaded by the Services.

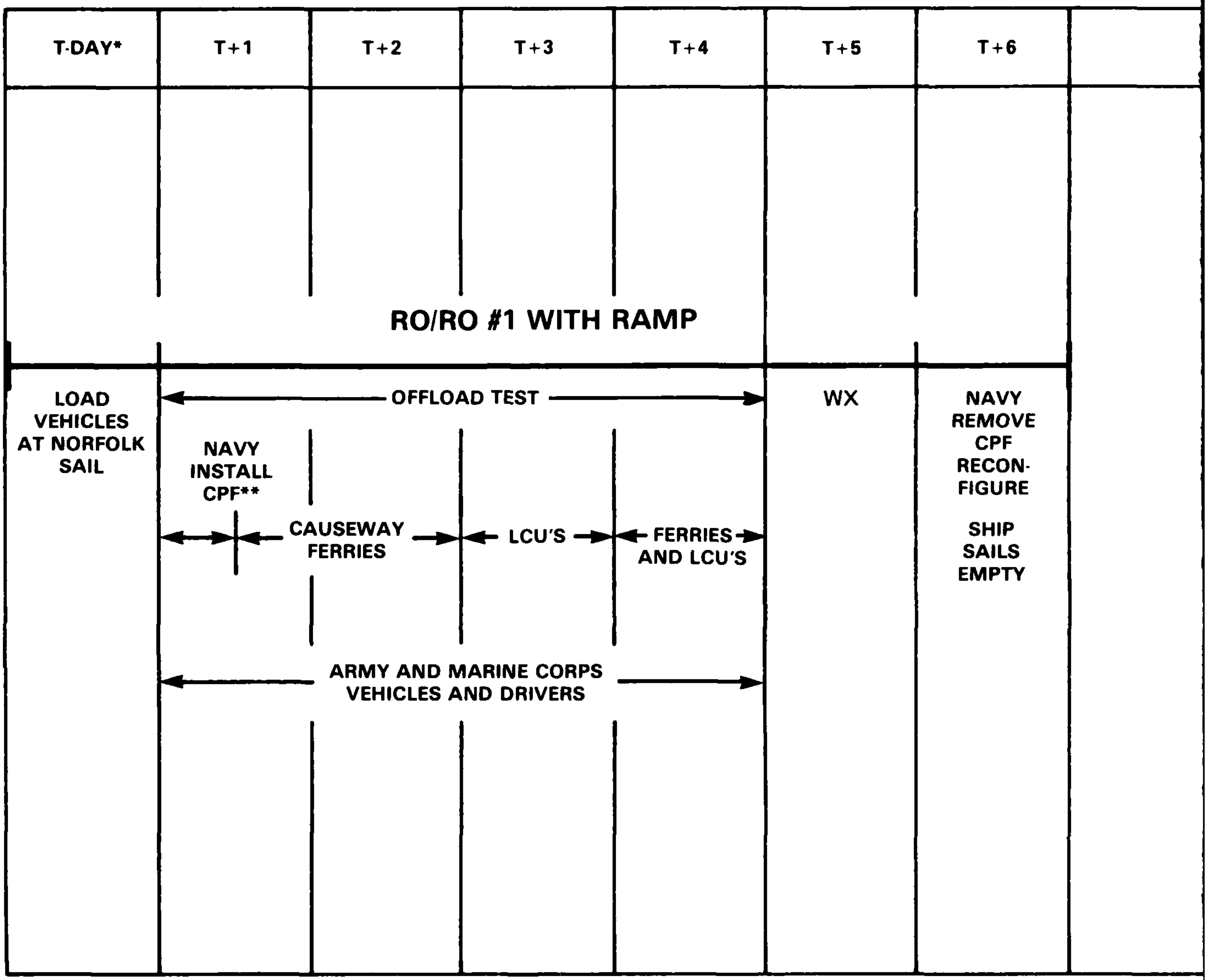
T-DAY*	T+1	T+2	T+3	T+4	T+5		T+6	T+7	T+8	T+9	
SEABEE SHIP							LASH SHIP				
LOAD AT PIER IN NORFOLK REPRESENTATIVE OUTSIZED EQUIP.		SAIL COMMENCE OFFLOAD OPS.	OFFLOAD REMAINING EQUIPMENT	ONLOAD SELECT OUTSIZED EQUIP. OFFLOAD SAME EQUIP.	WX DAY SHIP SAILS EMPTY		LOAD AT PIER IN NORFOLK REPRESENTATIVE OUTSIZED EQUIP.		SAIL COMMENCE OFFLOAD OPS.	OFFLOAD REMAINING EQUIPMENT	ONL SEL OUTS EQ OFFL SA EQ

* ESTIMATED DATE – AUG 1983
** EVENTS NOT PART OF JLOTSII

Figure 5 - Deployment Test Phase (Event Detail



etails), Fourth Quarter Fiscal Year 1983, Fort Story



* ESTIMATED DATE—OCTOBER 1983
** CPF—CAUSEWAY PLATFORM FACILITY
*** CPF/CWR—CAUSEWAY PLATFORM FACILITY WITH CALM WATER RAMP INSTALLED

Figure 6 - RO/RO Test (Event Details),

	T+7	T+8	T+9	T+10	T+11	T+12	T+13	T+14
	RO/RO #2 WITHOUT RAMP							
	SHIP ANCHOR FT. STORY NAVY INSTALL CPF/CWR EMBARK TEST VEHICLES FROM BEACH	← OFFLOAD TEST ← CAUSEWAY FERRIES → ← ARMY AND MARINE CORPS	← LCU'S →	OFFLOAD TEST → ← FERRIES → AND LCU'S VEHICLES AND DRIVERS →	WX	WX	NAVY REMOVE CPR/CWR*** SHIP SAILS EMPTY	

ils), First Quarter Fiscal Year 1984, Fort Story

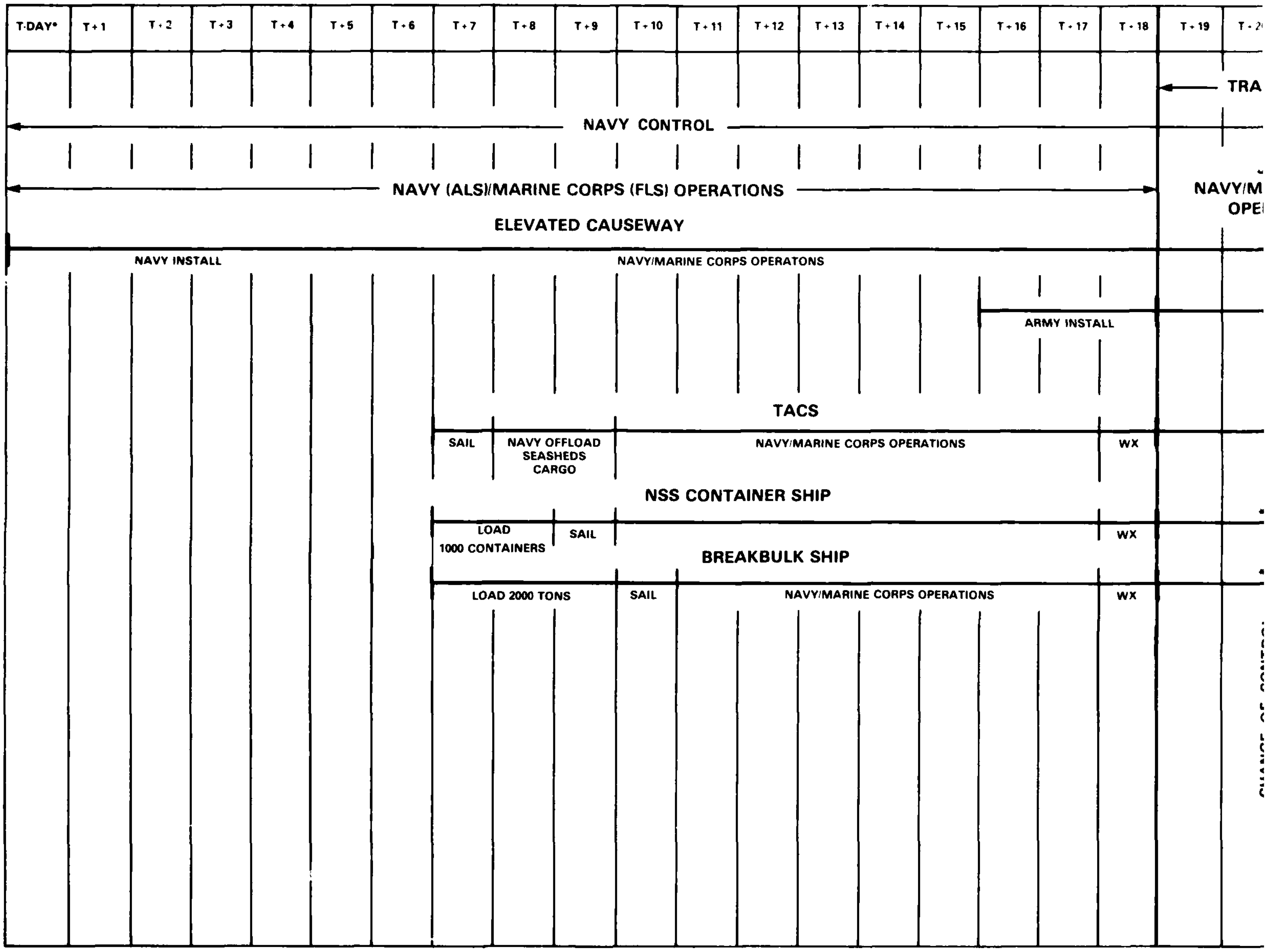
2

The vehicles will be a representative mix of RO/RO transportable military vehicles/rolling stock (with drivers) where one vehicle is defined as a complete unit of rolling stock. To illustrate, an M52A2 truck with an M127A2C trailer loaded with a twenty foot van is considered to be one vehicle. The schedule allows for the same 100 vehicles to be utilized on both RO/RO ships. Both Army and Marine Corps vehicles/drivers will be used throughout the entire Army and Navy test periods. The testing is structured to allow both the Navy and the Army to operate the CPF/CWR. The Navy will utilize causeway ferries and warping tugs at the CPF while the Army will use Army LCUs. It should be noted that the availability of RO/RO ships may dictate a change to the schedule shown in Figure 6.

THROUGHPUT TEST SCHEDULE

The Throughput Test is scheduled as shown in Figure 7. It is "symetrically" divided into Navy ALS/Marine Corps FLS operations, joint operations during transition of control, and Army LOTS operations.

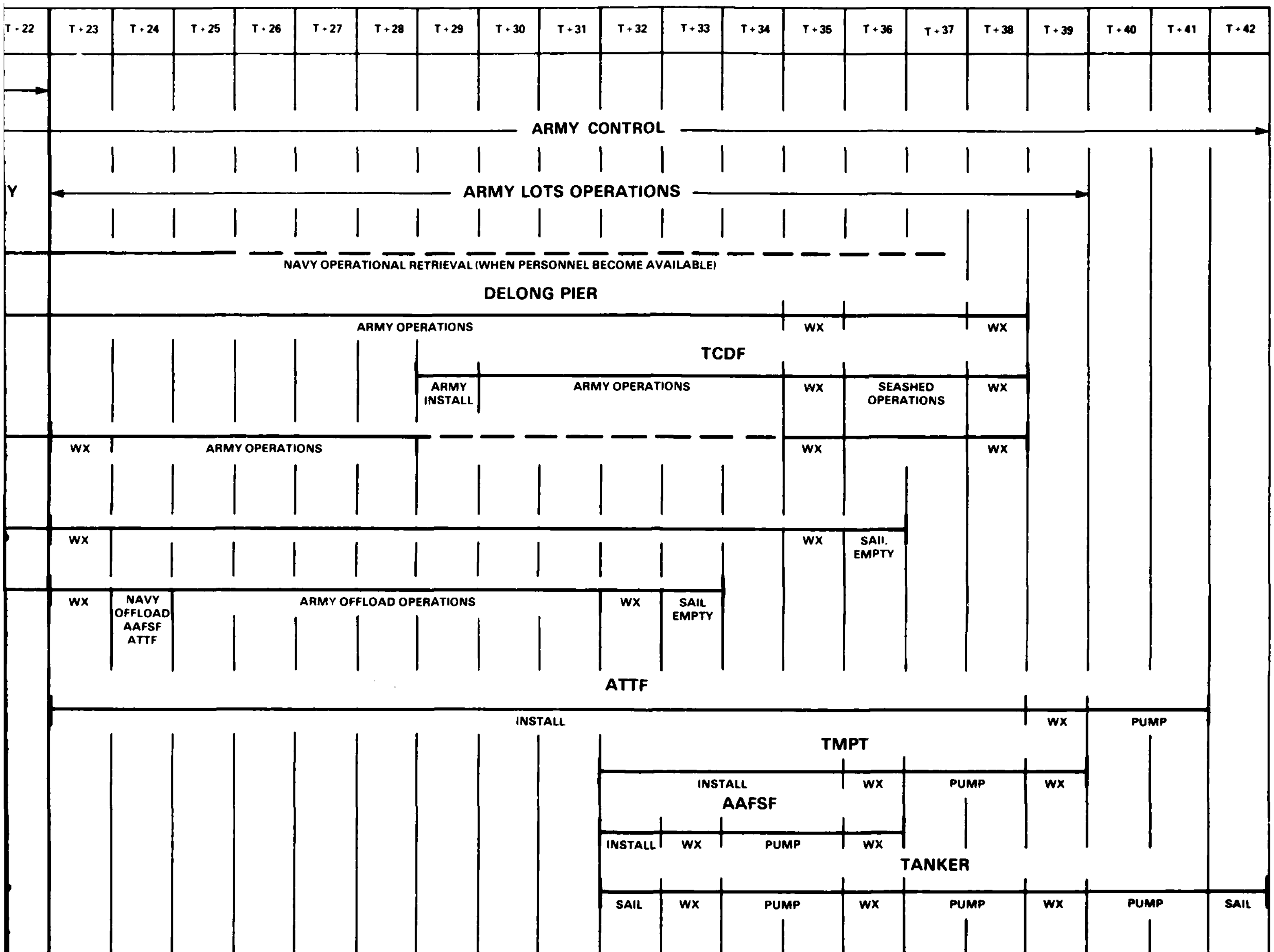
Transition will last four days between Navy ALS/Marine Corps FLS operations and Army LOTS operations. The first two days will be under the control of the established Naval Commander. During this period, the Army is assumed to arrive on station and proceed to activate its LOTS equipment while operating concurrently with Navy/Marine Corps forces. By the end of the second day, it is anticipated that all forces of the throughput system will be operating at the maximum capacity. Transition to Army control should occur at the beginning of the third day and concurrent operations of all forces continue through the end of the fourth day. Subsequently, a majority of the Navy/Marine Corps personnel and equipment will be administratively withdrawn and the remainder of the Throughput Test will be



* ESTIMATED DATE—SEPT, OCT 1984

** CONTAINER SHIP AND BREAKBULK SHIP FULLY LOADED PRIOR TO CHANGE OF SERVICE CONTROL

Figure 7 - Throughput Test, Fo



er Fiscal Year 1984, Fort Story

2

primarily an Army LOTS operation with the exception of some systems such as ELCAS and the bulk fuel system tests. The Field Test Plan will state how the personnel and equipment of all Services shall be utilized during the transition period. Multiple combinations exist. An extreme example might be the offloading of a Navy container onto an Army lighter to be offloaded at the ELCAS or DeLong Pier onto an Army truck to be delivered to the "Navy side" of the marshaling yard. That is, the delivery of Service cargo to the Service's depot must be insured and the joint usage of Service resources must be compatible with this mission. Cargo offload and retrograde operations shall be scheduled so that the containership and breakbulk ship are fully loaded at the time of transition from Navy to Army control. Details of cross utilization of Services' equipment and facilities during transition will be reflected in the Throughput Field Test Plan.

The installation of the AAFSF, ATTF, and AAFS will occur after ELCAS installation when Navy/Marine Corps personnel and equipment become available. To economize on the tanker charter costs, the TMPT, AAFSF, and ATTF shall be pumped in series, two days each, as shown in Figure 7.

Additional conditions reflected in the schedule are as follows:

- During the TACS containership offloading operations, testing will include the following Army events: Army operation of the ELCAS concurrent with DeLong pier installation, Army operation of both the ELCAS and DeLong pier concurrently, and finally Army operation of DeLong pier alone (without the ELCAS). However, during any periods that the Army operates the ELCAS, Navy personnel will continue to maintain the systems and monitor actual operations in order to insure that the ELCAS is operated safely and in an

efficient manner. Upon completion of the Army's use of the ELCAS it will be operationally retrieved by the Navy.

- The Navy will offload the AAFSF and ATTF from the breakbulk ship.

- The Army will not simultaneously utilize the TACS and the TCDF to offload the container ship.

- For contingency planning, the Army TCDF should be on site prior to the start of the Navy test operations to provide backup support for TACS operations.

- During Army operations, the TCDF will be used to discharge cargo from the Seasheds on the TACS. This is not the normal method of discharge from the Seasheds, but it is designed to develop data on the interface of the TCDF and Seasheds which has not been tested. This operation will comprise 1 or 2 days, depending on experience gained during the actual test.

V. RESOURCE REQUIREMENTS

The following tables break the JLOTS II Test Phases into individual test activities and identify the major system requirements. Tables for the Deployment Phase are grouped first for each of the Services.

Specific types of equipment to satisfy the system requirements set forth in these tables must be generated by the Services and included in the Field Test Plan for each phase. For example, a major criteria in determining equipment requirements for the container throughput test is to provide sufficient equipment to maintain the maximum flow of containers from the TACS to the marshaling yard. The estimated TACS capacity in sea state 1 conditions is 300 containers in a 20-hour day, utilizing two crane positions. This output should not be constrained by a lack of lighters alongside to receive containers or a lack of trucks, LACHs, cranes, RTCH's, etc., to maintain an uninterrupted flow of containers from the TACS to the marshaling yard.

The test schedules in Section IV were developed with consideration for shortfalls of equipment/personnel. For example, the ELCAS and ATTF installations are intentionally not overlapped in order to minimize the equipment/personnel requirements. This philosophy was carried throughout the JLOTS II scheduling and should be reflected in resource estimates.

TABLE 1

DEPLOYMENT TEST

NAVY SUPPORT REQUIREMENTS

TEST ACTIVITY	SYSTEM REQUIREMENT	MAJOR EQUIPMENT	REMARKS
1. Deploy and discharge selected JLOTS equipment on LASH ship	Shoreside tranfer facility	Elevated causeway system	ELCAS installation is a training event
	RO/RO facility	CPF, CWR	CWR deployed on causeway sections CPF shares causeway sections with ELCAS
	Test cargo	Outsized equipment	Load list to be included in Deployment Field Test Plan.
	Craft	Various lighterage warping tugs/tender boats	
2. Conduct discharge of LASH barge	Shoreside tranfer facility	Elevated causeway system	Barge discharge is a Throughput Test
	Cargo	LASH barges with mixed cargo	Combination container, breakbulk and vehicular
	Craft	Various	Round-the-clock operations

TABLE 2

DEPLOYMENT TEST

MARINE CORPS SUPPORT REQUIREMENTS

TEST ACTIVITY	SYSTEM REQUIREMENT	MAJOR EQUIPMENT	REMARKS
1. Deploy and discharge selected JLOTS equipment on LASH barges	Test Cargo	Selected equipment required for AFOE operations	Candidate loads to be identified in Field Test Plan
2. Conduct discharge of LASH barge	Breakbulk and container cargo handling systems	Cargo transport vehicles	Round-the-clock operations Operate across ELCAS

TABLE 3

DEPLOYMENT TEST

ARMY SUPPORT REQUIREMENTS

TEST ACTIVITY	SYSTEM REQUIREMENT	MAJOR EQUIPMENT	REMARKS
1. Deploy and discharge selected JLOTS equipment on LASH and SEABEE	Test cargo	Outsized equipment	Round-the clock operations Candidate loads to be identified in Field Test Plan
2. Conduct barge cargo OPNS	Shoreside transfer facilities	Army "A" DeLong Pier	Offload mixed cargo
	Craft	Workboats/Lighterage	
	Beach clearance	Tractor trailer	Operate across "A" DeLong Pier

TABLE 4

RO/RO TEST

NAVY SUPPORT REQUIREMENTS

TEST ACTIVITY	SYSTEM REQUIREMENT	MAJOR EQUIPMENT	REMARKS
1. Conduct RO/RO ship discharge operations (one RO/RO with and one without ramp),	Calm Water RO/RO Drive-Off	CPF CWR	Round-the-clock operations
	Craft	Warping tugs LCU's Causeway ferries	

TABLE 5

RO/RO TEST

MARINE CORPS SUPPORT REQUIREMENTS

TEST ACTIVITY	SYSTEM REQUIREMENT	MAJOR EQUIPMENT	REMARKS
1. Conduct RO/RO ship ops	Beach clearance and cargo management		Will need drivers & maintenance support
	Test cargo	Various wheeled and tracked vehicles	Test vehicles to be identified in Field Test Plan
			Round-the-clock operations

TABLE 6

RO/RO TEST

ARMY SUPPORT REQUIREMENTS

TEST ACTIVITY	SYSTEM REQUIREMENT	MAJOR EQUIPMENT	REMARKS
1. Conduct RO/RO discharge and throughput operations	RO/RO discharge facility	CPF (Navy) CWR (Navy)	Round-the-clock operations
	Craft	LCUs	
	Test cargo	Various wheeled and tracked vehicles	Test vehicles to be identified in Field Test Plan

TABLE 7

THROUGHPUT TEST

NAVY SUPPORT REQUIREMENTS

TEST ACTIVITY	SYSTEM REQUIREMENT	MAJOR EQUIPMENT	REMARKS
1. Real-time beach installation	Shoreside tranfer facility	Elevated causeway system	Round-the-clock installation
	Craft	Warping tugs Various lighterage	
2. Conduct sustained container discharge and throughput for AFOE operations, retrograde all containers back to ship	NSS containership transfer facility	TACS	Round-the-clock container discharge operations
	Craft	Various lighterage	
	Shoreside transfer system	ELCAS	1000-20′containers
	Lighterage Management	C^3	All containers to be retrograded by transition
3. Conduct breakbulk throughput operation concurrently with containers	Cargo Handling	Hatch team equipment	2000 tons breakbulk test cargo
	Craft	Various lighterage	
	Lighterage management	C^3	Round-the-clock operations
			All cargo to be retrograded by transition

TEST ACTIVITY	SYSTEM REQUIREMENT	MAJOR EQUIPMENT	REMARKS
4. Deploy, install, and operate bulk fuel facility	Bulk fuel transfer facilities	Amphibious Assault Fuel Supply Facility (AAFSF)	Installation not to be overlapping or coincident with ELCAS installation
		Amphibious Tanker Terminal Facility (ATTF)	Deployed aboard breakbulk ship
			Daytime installation
	Craft	Warping tugs	
		Various lighterage	

TABLE 8

THROUGHPUT TEST

MARINE CORPS SUPPORT REQUIREMENTS

TEST ACTIVITY	SYSTEM REQUIREMENT	MAJOR EQUIPMENT	REMARKS
1. Real-time beach installation (and dumpsites)	Beach development and organization	Beach grading equipment Service vehicles Road surface materials	Around-the-clock ops until beach support area & dump sites ready for ops D+1 to D+5
2. Conduct sustained container discharge & throughput for AFOE ops. Retrograde all containers back to ship	Beach clearance system	Beach discharge equipment Container transport vehicles	Around-the-clock ops to receive cargo, manage its stowage and inland distribution. Some LACHs may shift inland. All containers to be retrograded by transition.
	Cargo management	C^3	
	Marshaling yard ops		
3. Conduct breakbulk throughput ops concurrently with container ops	Beach clearance system	Beach discharge equipment Cargo transport vehicles	All cargo to be retrograded by transition
	Cargo management Marshaling yard ops	C^3	Round-the-clock operations
4. Deploy, install & operate bulk POL facility	Receive bulk cargo at beach and store it	Amphibious Assault Fuel System (AAFS)	Size of system & quantity to be pumped TBD
5. Cargo Management and Movement Control	Documentation		Round-the-clock

TABLE 9

THROUGHPUT TEST

ARMY SUPPORT REQUIREMENTS

TEST ACTIVITY	SYSTEM REQUIREMENT	MAJOR EQUIPMENT	REMARKS
1. Real-time beach installation and retraction	Shoreside transfer facilities	"A" DeLong Pier Amphibious Discharge point	Requires ocean going tug to deploy Round-the-clock operations
	Craft	Workboats/Lighterage	Road improvement (MOMAT/Sand Grid)
	Beach preparation	Beach grading equipment Service vehicles MOMAT or equivalent	
2. Conduct sustained container disch. & throughput operations	NSS containership discharge facility	Navy TACS Army TCDF	All containers to be offloaded by end of exercise Round-the-clock operations
	Craft	Various lighterage	
	Shoreside Transfer Facility	Army "A" DeLong Pier Navy ELCAS Beach discharge equipment	
	Beach clearance	Tractor trailer	
	Marshaling yard equipment	RTFL RTCH	
	Army Cargo Management	C^3	
	Army Lighterage Management	C^3	

TEST ACTIVITY	SYSTEM REQUIREMENT	MAJOR EQUIPMENT	REMARKS
3. Conduct sustained breakbulk cargo discharge and throughput operations concurrently	Breakbulk discharge		Self sustaining breakbulk
	Craft	Various lighterage	All cargo to be offloaded by end of exercise
	Shoreside transfer system	Beach discharge equipment	Round-the-clock operations
	Beach clearance system	Tractor trailer	
	Marshaling yard ops	RTFL Mobile crane	
4. Deploy, install & operate bulk POL system	Bulk fuel transfer, storage and distribution facilities	Tactical Marine Petroleum Terminal (TMPT)	Stored at Fort Story
	Craft	Work boats Various lighterage	
5. Cargo management and movement control	Documentation, ADP support	Data processing equipment, configured for field operations	Dept. of Army Standard Port System will be tested
			Round-the-clock operations
	Movement control		
6. Command, control and communications for joint opns	Command, control communication, lighting and power generation systems		Maximum use of TOE equipment Round-the-clock operations

TEST ACTIVITY	SYSTEM REQUIREMENT	MAJOR EQUIPMENT	REMARKS
7. Maintenance support operations	DS/GS marine/automotive and special support		Maximum use of TOE equipment Round-the-clock operations

VI. EVALUATION

INTRODUCTION

The overall effectiveness of a logistics organization is based on getting the proper type and quantity of materiel to the combat force when and where it is needed with a Combat Service Support (CSS) organization that is affordable in terms of manpower and equipment. In order to provide a basis for determining effectiveness, logistics system capabilities are normally expressed in terms of daily throughput. This daily throughput is the amount of materiel offloaded from merchant shipping and delivered to holding locations ashore and is generally stated in terms of tons per day, containers per day, vehicles per day, and gallons per day. Cargo throughput, thus expressed, can vary widely. Personnel status, equipment characteristics and availability, as well as environmental influences, have direct effects on productivity. In view of the sensitivity of over-the-shore delivery operations to these and other factors, a system must be capable of operating under a fairly wide range of conditions and, over time, still meet average throughput requirements. Sufficient quantities of supplies, equipment, and bulk liquids must be moved ashore not only to sustain daily consumption but also to build up safe levels for accommodating interruptions and losses due to enemy action, storms, and the like. That average daily total requirement becomes the major operating objective of the CSS force.

The ability to deploy ALS/FLS/LOTS systems is a major area to be evaluated. Deployment encompasses all steps necessary to loadout, transport, and offload all needed equipment, personnel, and logistics

supplies to an objective area in order to establish a throughput capability. Much of the ALS/FLS/LOTS equipment is standard military gear for which deployment requirements are well known. JLOTS II will concentrate on testing the ability to deploy selected new or hard to handle items on LASH and SEABEE vessels. Thus the evaluation will take into account the suitability and effectiveness of specialized sealift resources and the capability to deploy the selected equipment and move it to the shore. Time, manpower, and special equipment requirements are important factors in deployment operations.

A second major area to be evaluated is the installation and/or preparation of ALS/FLS/LOTS systems for operation. In many cases, new systems such as the Navy Elevated Causeway have not been installed in an around-the-clock operational scenario, and specific information is not available to accurately plan for the proper time, manpower, and equipment needed.

Finally the operation and management of over-the-beach cargo throughput systems will be evaluated. This evaluation must account for such factors as environmental conditions, equipment availability, equipment performance, types of cargo, cargo accounting/control procedures, safety, etc.

An underlying criteria for JLOTS II test and evaluation is to provide sufficient factual data and results to permit future operational planners to identify the specific force levels needed to satisfy the requirements of their particular situation.

EVALUATION METHODOLOGY

A detailed data management plan will be prepared for each phase of JLOTS II covering data element requirements; data collection; and data reduction, storage, retrieval, and distribution. An overall analysis and

evaluation concept document will establish the JLOTS II approach to treatment of the data generated by the testing and the formulation of conclusions and recommendations.

Data Requirements

The methodology used to develop data element requirements includes construction of a data requirement logic structure. This logic structure comprises test measures derived by dividing test objectives into sub-objectives, subobjectives into essential elements of analysis (EEA), and EEAs into progressively finer subdivisions until detailed data requirements emerge. Using this methodology, care must be taken to insure that within each subdivision all possible data items are considered. The selected data items are then used as a basis for developing specific data questions and data form entries.

Data Collection and Analysis

Both qualitative and quantitative data will be collected during JLOTS II tests. The specific data collection approach will use a combination of manual entries on prepared data forms, radio voice communication of data to a central data collection center, and narrative written descriptions of specific events. Each will be used only in those instances where it is most appropriate. Qualitative data will be collected by experienced observers to the extend possible and analysis will include comparison of data for consistency between observers. Quantitative data will, where sample sizes permit, be analyzed using available statistical procedures including analysis of variance to determine quality. Simple modeling procedures, such as a Monte Carlo model, may be used if applicable. Analysis will include an assessment of sensitivity of system operation to influencing factors and variables.

Evaluation Procedures

Evaluation of JLOTS II results will basically involve a reverse of the procedure used to develop the data requirements. This approach combines the information at each level of the logic structure and focuses on the results and conclusions that provide the objective assessments. In a broad sense, the evaluation will provide conclusions and recommendations derived from the test data that will document the performance and operating capabilities of ALS/FLS/LOTS systems tested, and will form the basis for planning factors in terms of time, manpower, and equipment for future operational needs.

VII. SITE SELECTION

Test sites were evaluated on administrative and operational criteria to identify a location which was supportable by all of the Services' and which offered a favorable proability for obtaining sea state 3 conditions. The East Coast was preferred so major military movement costs could be avoided.

Fort Story has been selected as the site for all three JLOTS II tests. It is convenient for both the Deployment Test and RO/RO Test because of its proximity to the Norfolk terminals where the test equipment will be loaded aboard the LASH, SEABEE, and RO/RO ships. It is appropriate for the Throughput Test because of the probability of sea state 3 in the September/October time frame, adequate water depth, and sufficient beach area to support the activities of this joint military operation. Also, the proximity to Fort Eustis and Little Creek results in minimum cost of transporting equipment to the test site and ensures the availability of a haven, if required, for maintenance, emergencies, or other contingencies.

Although, some environmental considerations are required, the environmental impact is not expected to affect the succcessful performance of the JLOTS II tests.

Figure 8 is a photograph of the hardware installation at Fort Story during the JLOTS I testing.

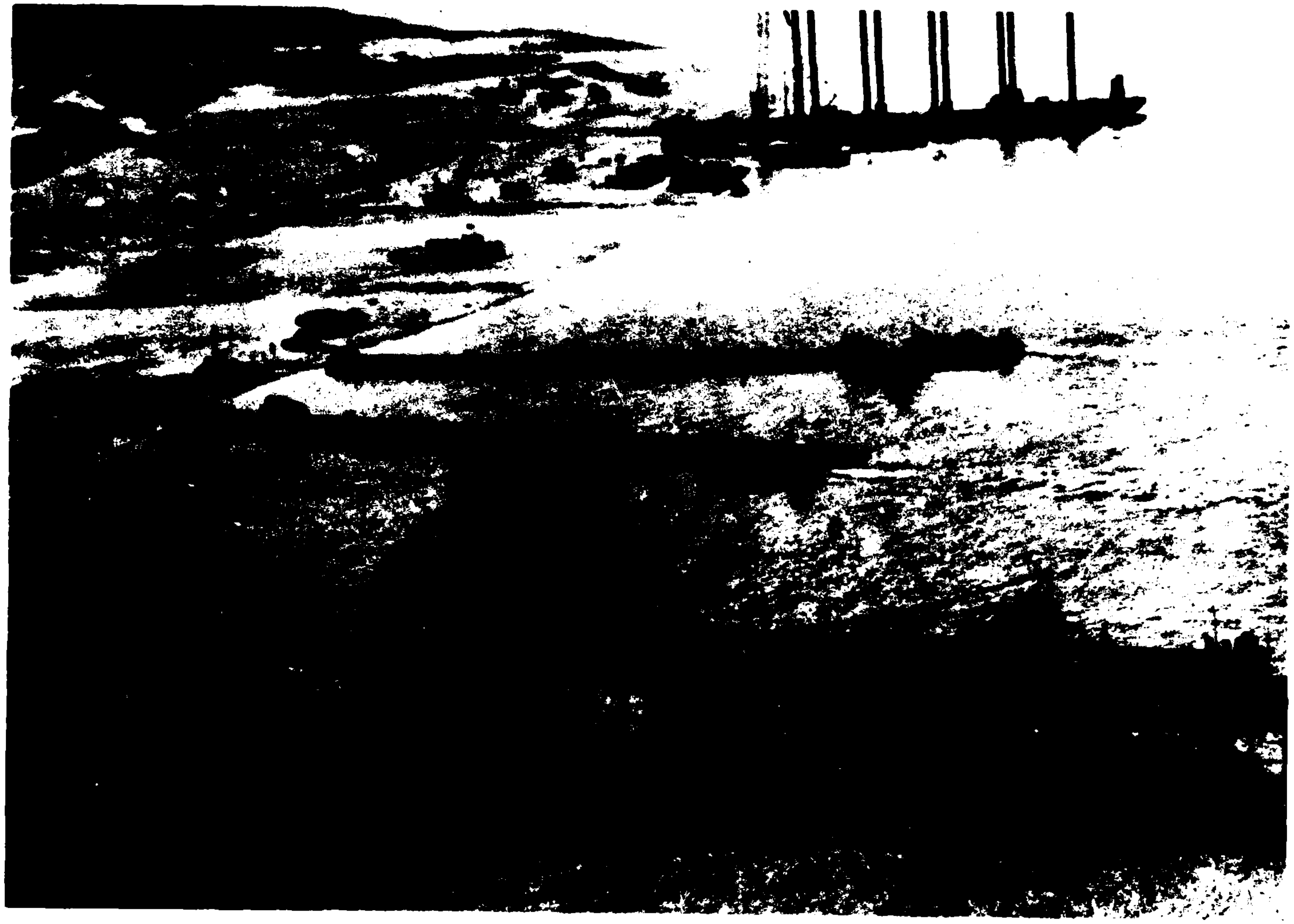


Figure 8 - JLOTS I Beach Installations at Fort Story

VIII. CONTINGENCY CONSIDERATIONS

GENERAL

Unexpected events such as storms and major equipment breakdowns cannot be predicted with sufficient accuracy to preclude the possibility that they will adversely affect the test execution. Therefore, to minimize the potential adverse impact of such events, two planning actions are necessary. First, each test schedule of a major event which is not easily repeatable in terms of rescheduling will be constructed with some scheduling flexibility, and second, key tests which involve items of equipment essential for the execution of the test will have provisions for providing back-up support which will permit the test to be conducted and to yield usable results.

WEATHER CONDITIONS

Sea state is the most likely cause of weather delays. How much operations may be curtailed and to what degree ship unloading, lighterage, and shoreside unloading systems are affected by worsening sea states are all important elements of the evaluation. A significant weather change at any point in the exercise will permit an evalution of its impact on ship unloading methods, lighter resources, and whatever shoreside unloading method is being used at the time.

During the test, periodic daily weather and sea state forecasts and severe weather warnings will be made available to the JTD and promptly distributed to operational command and evaluation personnel to provide time for the JTD to plan and execute changes in operations. A series of alternative schedules will permit each unloading system to be activated during the heavy weather conditions so that data can be collected.

Attention will be directed to forecasts of cessation of high sea states after suspension of test operations. Experience in Offshore Discharge of Containership (OSDOC) II and past over-the-shore operations indicates that resumption of work has lagged unnecessarily behind a return of reasonable sea states. Because of overriding safety considerations, the decision to continue or to cease operations during heavy weather conditions will be made by the JTD.

EQUIPMENT AVAILABILITY

Performance of JLOTS II test events should not be put in jeopardy by equipment breakdowns or other conditions which might prevent their effective use. The normal complement of spare lighters, trucks, cranes, etc., should be evaluated by the Services to ensure that equipment availabilities will cover the most likely and most critical of foreseen contingency possibilities. In general, bottlenecks that impede the flow of cargo must be prevented or circumvented.

IX. DESCRIPTION OF SYSTEMS TO BE TESTED

The JLOTS II cargo throughput systems are divided into seven major categories identified below. Major equipment components are listed under each category. Items with asterisks are considered relatively new or Service unique and are described in the following paragraphs to provide JLOTS participants with a common understanding. The barge mounted Reverse Osmosis Water Purification Unit (ROWPU) is programmed to be available as a prototype during the second quarter, Fiscal Year 84. If all testing and development milestones are completed, this system will be installed during the Throughput Phase.

SHIPS TO DEPLOY EQUIPMENT, PERSONNEL AND CARGO

LASH	Container
Seabee	Breakbulk
RO/RO	TACS (with Seasheds) *
Tanker	

SHIP OFFLOADING SYSTEM

- TACS *
- RO/RO Calm Water Offloading Facility *
- Army TCDF *

LIGHTERAGE FOR SHIP-TO-SHORE TRANSFER

- Causeway Ferry (including PCS) *
- LCU
- LCM-8
- LACV-30 *
- LARC-60

SHORESIDE UNLOADING SYSTEM

ELCAS *

DeLong Pier (A section) *

LACH *

RTCH

Amphibian Discharge Crane

BEACH IMPROVEMENT SYSTEMS

MOMAT

Sand Grid Roadway *

POTABLE WATER SYSTEM

Barge Mounted Reverse Osmosis Water Purification Unit (ROWPU)*

BULK POL SYSTEMS

AAFSF * AAFS *

ATTF * TMPT *

MANAGEMENT AND CONTROL SYSTEM

Department of the Army Standard Port System (DASPS) *

USMC Cargo Accounting System

Auxiliary Crane Ship (TACS) With Seasheds

The latest offloading system being developed to offload containerships is the TACS. The current concept calls for the modification of the President Polk class containerships (C6-S-1qc) by installing three twin-boom pedestal cranes. The Operational Requirement for Auxiliary Crane Ship (TACS), 16 July 1982, states:

'The TACS shall be a complete, self deployable, container/oversize cargo discharge system. It shall be deployed to advanced operating areas and shall be capable of performing the following operations:

- Offload 33 short tons at 108' reach from the skin of the TACS
- Offload 65 short tons at 75' reach from the skin of the TACS

- Self offload powered causeway sections (95 short tons 25′ reach from the skin of the TACS)."

In addition the requirement states:

"The sustained lift productivity (throughput) of each crane ship system given the expected distribution of standard cargo weight and size, day and night average, over a twenty-hour working day, shall meet or exceed."

	SEA STATE			
	0	1	2	3
Lifts per Vessel	300	300	280	260

From a military point of view, the TACS is a system which will support any service involved in an over-the-shore operation. The conceptual application of the TACS is uniquely suited for the JLOTS II test. Upon arrival at the test site off Fort Story, the TACS will drop anchor and unload its own cargo onto lighters for transit to the beach. It will then commence offloading operations with the containership positioned along its starboard side as shown in Figure 9.

The TACS is a self-contained, government-owned vessel. It will house all required support equipment and personnel including mooring fenders, lines and winches, crane operators, and line handlers. The line handlers not only pass the mooring lines for cargo ships and lighters along each side of the TACS, but also provide any adjustments which are necessary as the waterline changes while the cargo ship is being offloaded. Longitudal repositioning of the ships will also require line handling coordination.

TACS

AUXILIARY CRANE SHIP

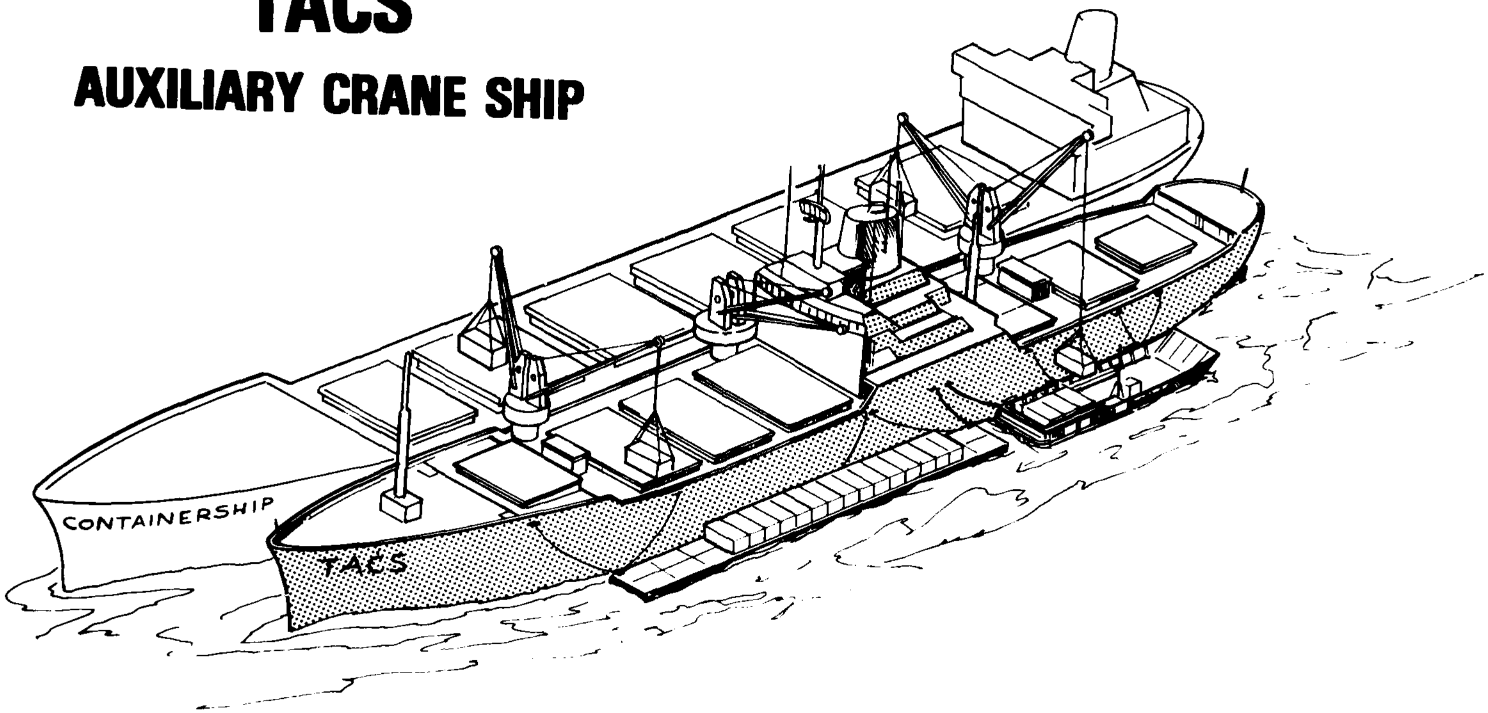


Figure 9 - Auxiliary Crane Ship (TACS)

Seasheds provide containerships with the capability to transport outsized and other cargo such as trucks, tanks, and palletized cargo. It is a large open top container which is positioned by a shoreside container crane into the ship's container holds in place of three side-by-side containers. Minor modifications to the TACS cargo hold are required to accommodate the Seashed. The principal modifications include strengthening of the center cell guides and the tank top in the bottom of the applicable cargo hold. Figure 10 gives an illustration along with some of the principal data. Since the Seashed is 50% higher than a standard ISO container, four can be stacked in the vertical space normally holding six containers. The Seashed floor has a large hatch cover which can be opened electrically for cargo work-through, as shown in Figure 11.

The Seashed has steel box beams and columns for its main frame. Located on the top corners are stacking cones for securing one shed on top of another. The following list identifies the principal dimensions of the Seashed.

- Exterior maximum dimensions: 40 ft long by 25 ft wide by 12 ft 6 in. high (excluding 4, 3 in. high shear cones on top).
- Inside clear dimensions with work-through floor closed: 35 ft 10 in. long by 22 ft 9 in. wide by 10 ft 10 in. high.
- Clear opening through floor: 30 ft long by 18 ft wide.
- For purposes of analysis, eligible cargo for the lower Seashed should not exceed the following dimensions: 29 ft 6 in. long by 17 ft 4 in. wide by 10 ft 10 in. high.

The floor, with cargo tie-down fittings, will be built to accommodate the following distributed and concentrated loads:

- Uniform load: 425 psf (150-ton distributed cargo)

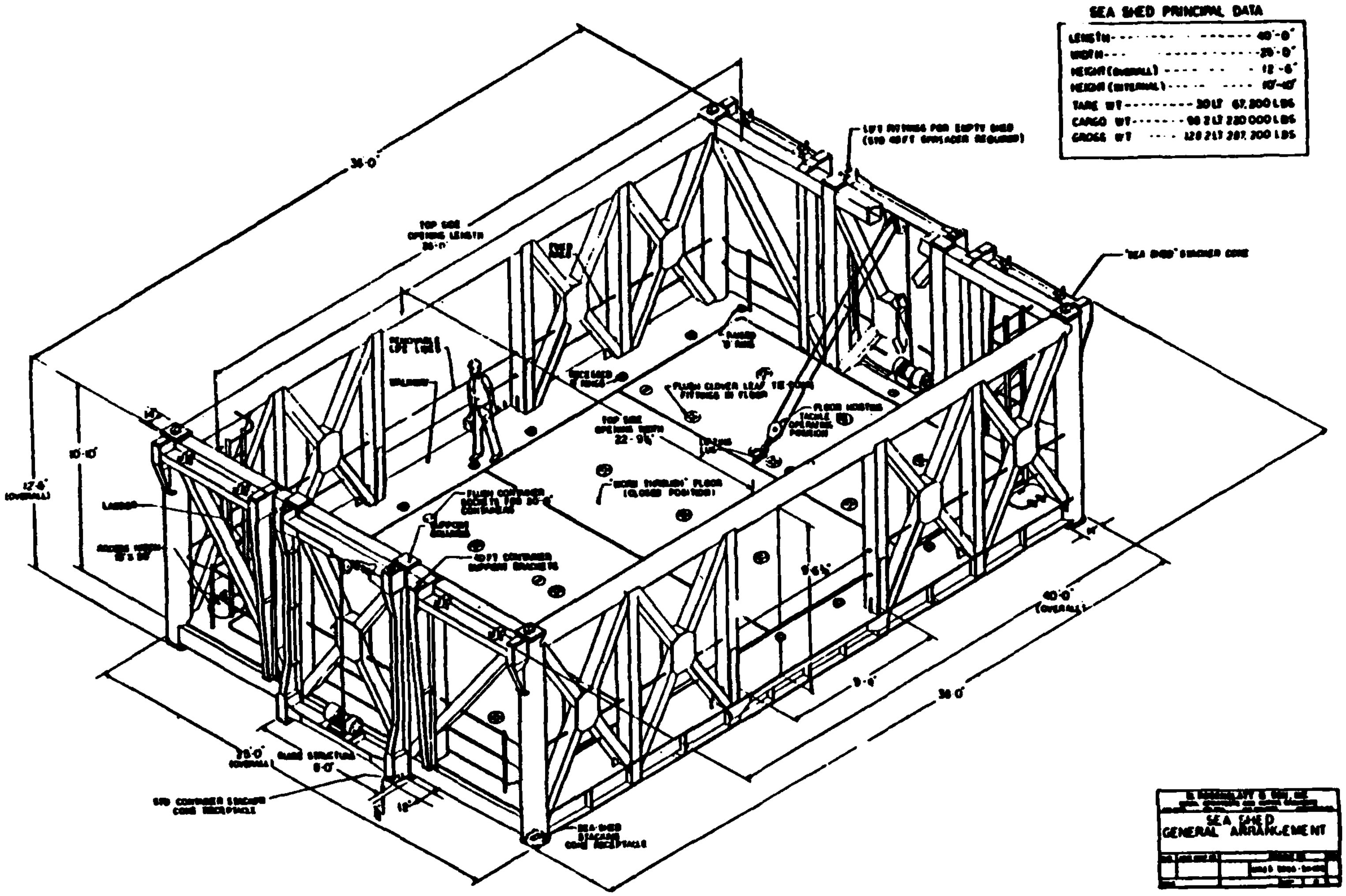


Figure 10 - Seashed Principal Data

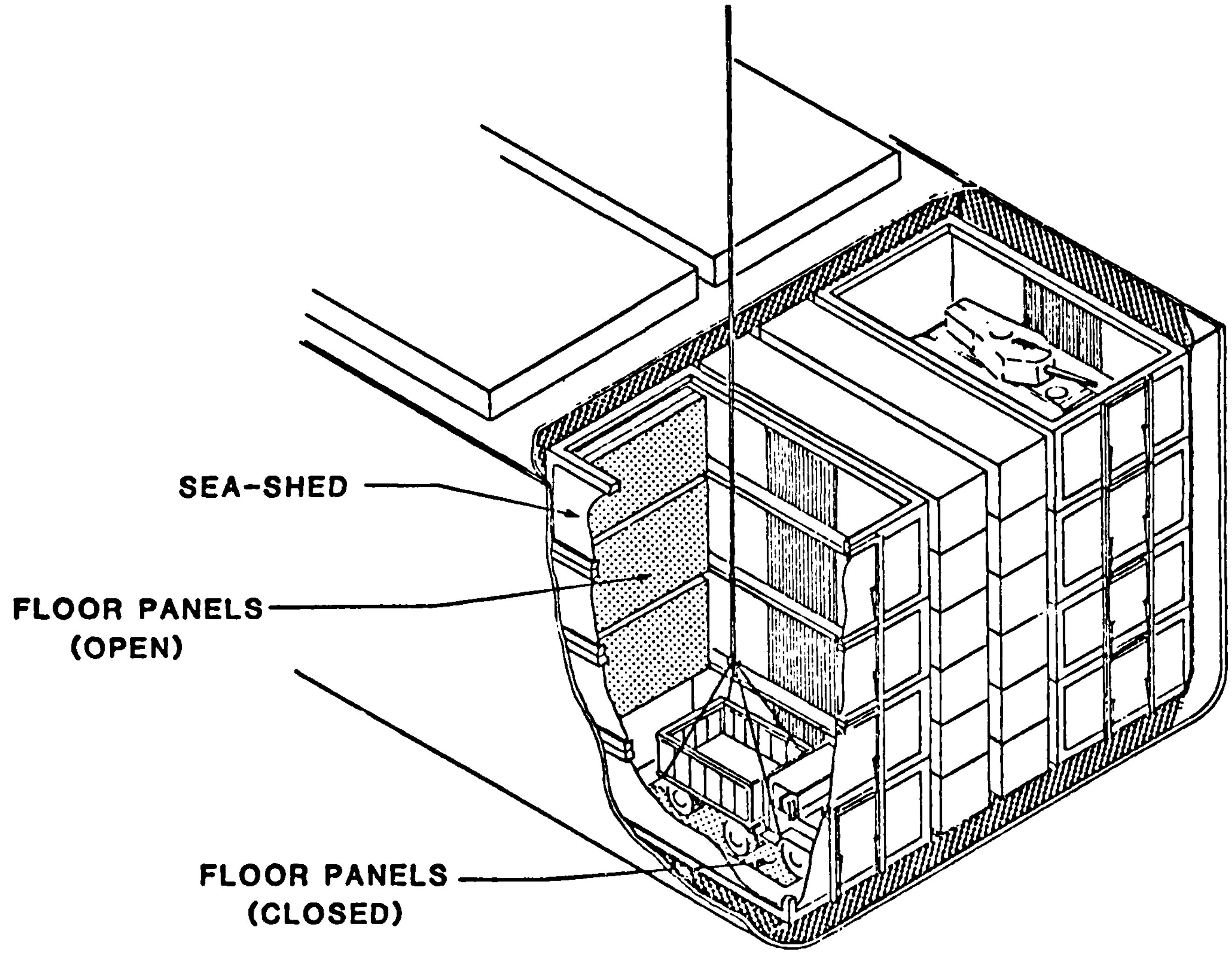


Figure 11- Seashed Work-Through Method

- Concentrated load: 26,000 pounds (axle load, 10-ton truck, 6 by 6).

13.5 psi (track pressure, M-1 tank)

Calm Water RO/RO Ship Offloading Facility

Logistic support necessary to sustain major contingency operations, including amphibious assault landings and over-the-shore evolutions, relies increasingly on the utilization of RO/RO ships.

Amphibious assault operations or LOTS contingency operations are usually conducted over undeveloped beaches where port facilities are not available. The calm water drive-off facility is being developed to provide a rapid near-term solution to the lack of improved port facilities. The drive-off facility discharge rates are tabulated below:

System	Delivery Rate	Sea State	Goal	Threshold
RO/RO Calm Water Drive-Off Facility	Discharge Rates (Units/20-hr Day)	SS 0	500	200
		SS 1	250	100

A fully capable sea state 3 system is being investigated and is planned for future development.

The calm water drive-off facility will enable military vehicles carried onboard RO/RO ships to be driven down ramps to lighterage for transport to the beach. Figure 12 illustrates the drive-off method being used to offload a RO/RO ship which is configured to transport and deploy its own offloading ramp. Figure 13 illustrates the drive-off method being used to offload a NSS RO/RO ship. A special purpose ramp called the Calm Water Ramp (CWR) is needed since this ship type does not carry its own offloading ramp.

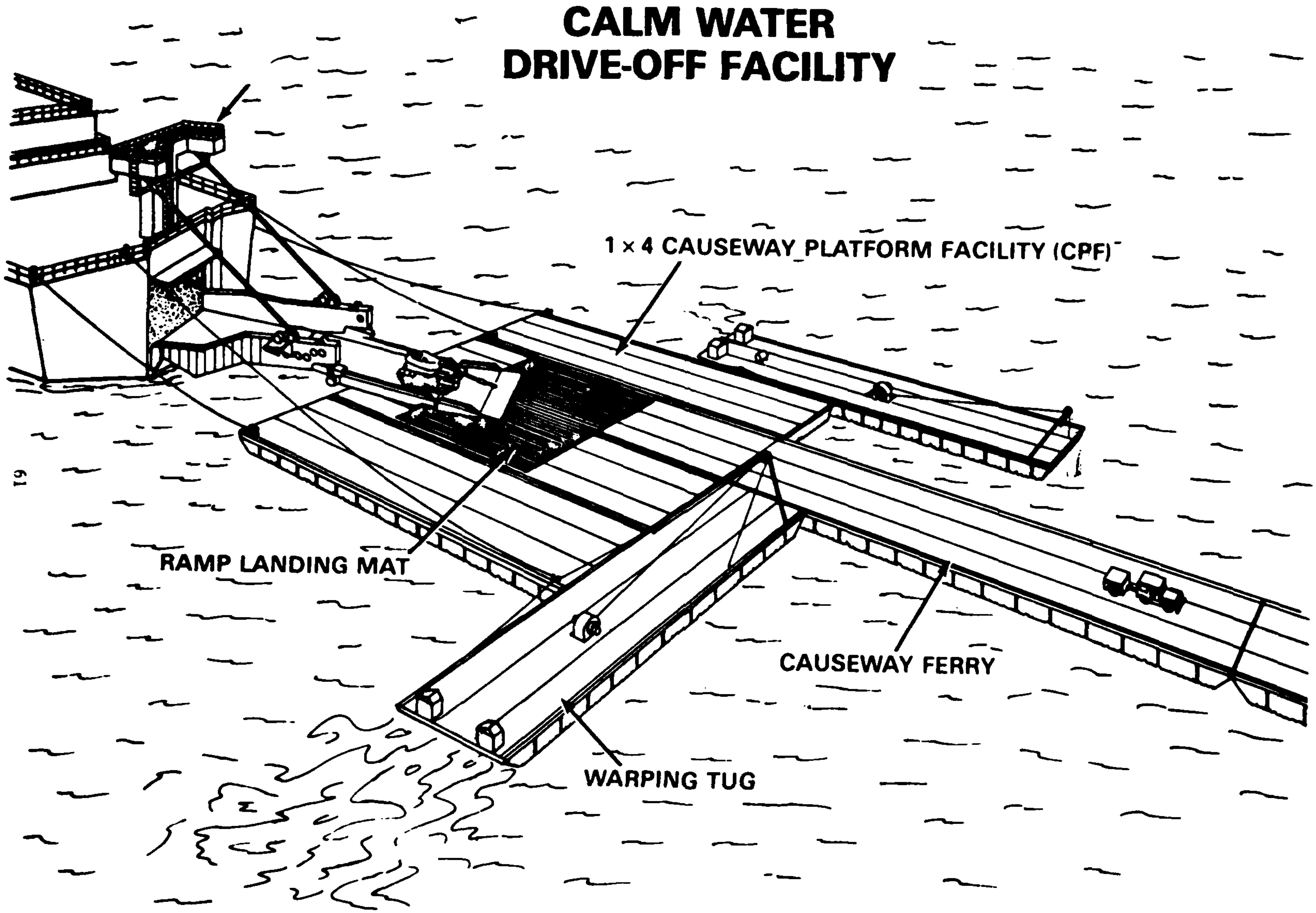


Figure 12 - Calm Water Drive-Off Facility

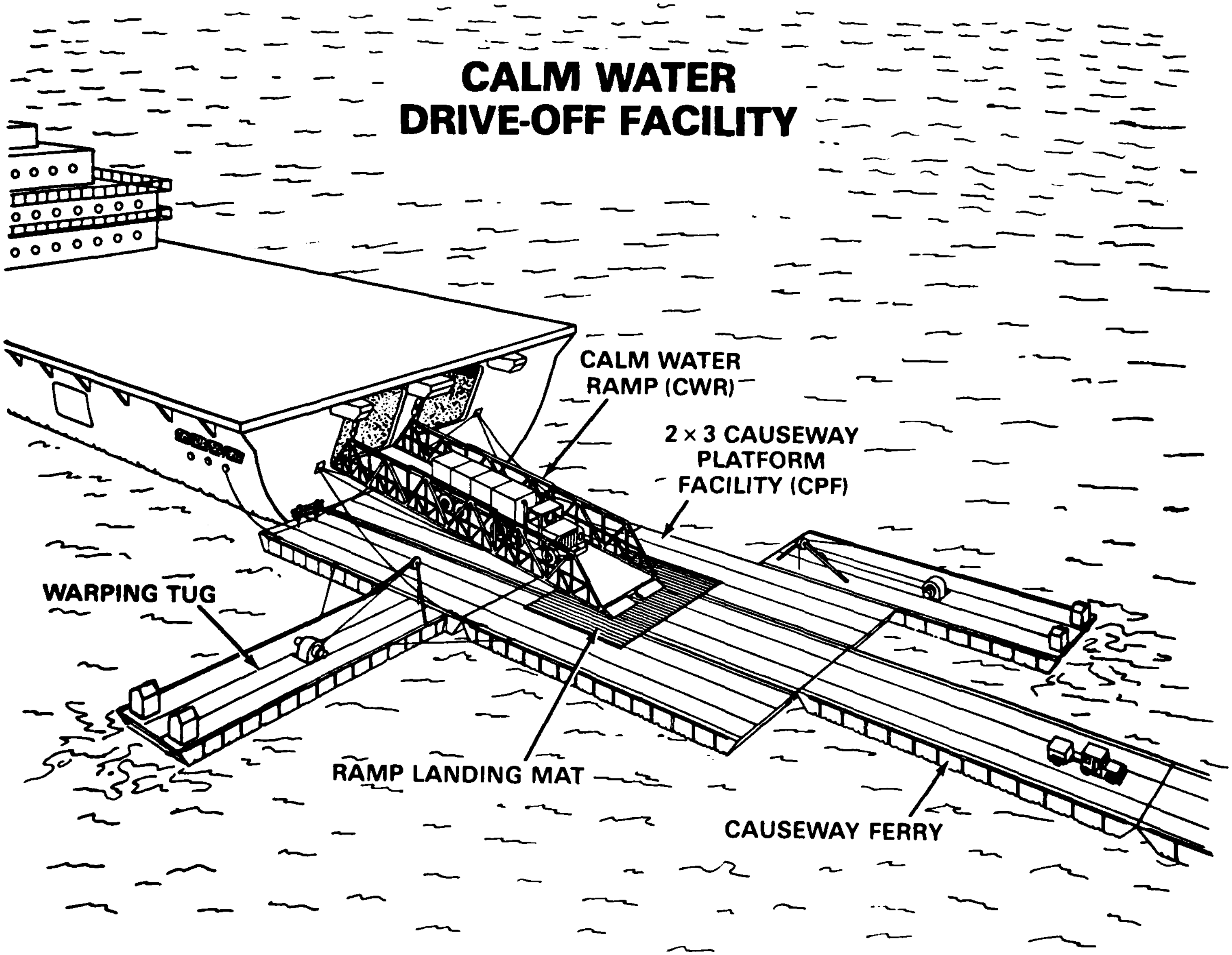


Figure 13- Calm Water Drive-Off Facility

The calm water drive-off facility consists of the following major components:

- One Causeway Platform Facility (CPF), made up of six 21 ft by 90 ft causeway sections connected together to form a floating platform about 65 ft wide by 180 ft long. The CPF includes adjustable fenders to interface with the RO/RO ship, mooring lines, a ramp landing mat (steel plate and wood dunnage) and miscellaneous support equipment.
- One CWR which is made up from three 40 ft long sections bolted together to form a 120 ft long ramp.
- Three warping tugs or equivalent. These tugs assemble the CPF and CWR, move the assembled platform to the anchored RO/RO ship, and position and moor the CPF to the ship.
- Four causeway ferries or equivalent to shuttle the vehicles from ship to shore.

One deployment concept for the calm water drive-off facility includes embarkation of the system components on a LASH vessel. In the operating area, the warping tugs will be offloaded first, followed by the remaining gear. After the necessary equipment installation and assembly tasks are completed, the facility is ready for operation. After arrival of the self-sustaining RO/RO ship, the CPF will be brought to the ship and moored at the desired location. The ship will lower its own offloading ramp onto the CPF and discharge operations will commence.

Prior to arrival of the NSS RO/RO ship, the CWR will be positioned on the CPF. After the ship is at anchor, the CPF will be moored at the designated transom or side port. When the CPF is properly secured, the ship, using its ramp handling winches, will raise the CWR to the offloading port. Military vehicles will be driven down the ramp and onto

the ferry, one vehicle at a time, in accordance with the offloading plan and as shown in Figure 13. There will be a continuous flow of lighterage to the beach until the ship is offloaded.

TCDF

The Army's TCDF consists of a P&H 6250, 250/300 STon lifting capacity crane mounted on a "B" Delong barge (see Figure 14). The TCDF, operated by Transportation Terminal Service Company (Container) personnel, will moor alongside the containership to offload containers during JLOTS II. The TCDF operations are scheduled after the Army's participation in the TACS operation. The total weight of the TCDF is approximately 775 STons. The crane with a 130 ft boom makes up approximately 180 STons of that total. The "B" DeLong barge measures 150 ft by 60 ft by 10 ft; the P&H 6250, 66.1 ft by 12 ft by 13.5 ft.

Powered Causeway and Causeway Ferry

The powered causeway is a Navy 21 ft by 90 ft by 5 ft causeway section specially outfitted with a waterjet propulsion system (see Figure 15). It can be equipped as a warping tug or can serve as a lighter, either singly, or with one or more regular causeway sections attached to its bow and called a causeway ferry as shown in Figure 16. The powered causeway weighs 80 long tons and can be side-loaded on LSTs or loaded on merchant ships (e.g., LASH & SEABEE) for deployment. Its shallow draft is compatible with beaching operations.

During the JLOTS II Throughput Phase, the causeway ferry and the Landing Craft, Utility (LCU) will be the primary Navy lighterage for container offload operations from the TACS. The causeway ferry will consist of a powered causeway section plus two regular causeway sections. In calm water the powered causeway section can carry up to four containers

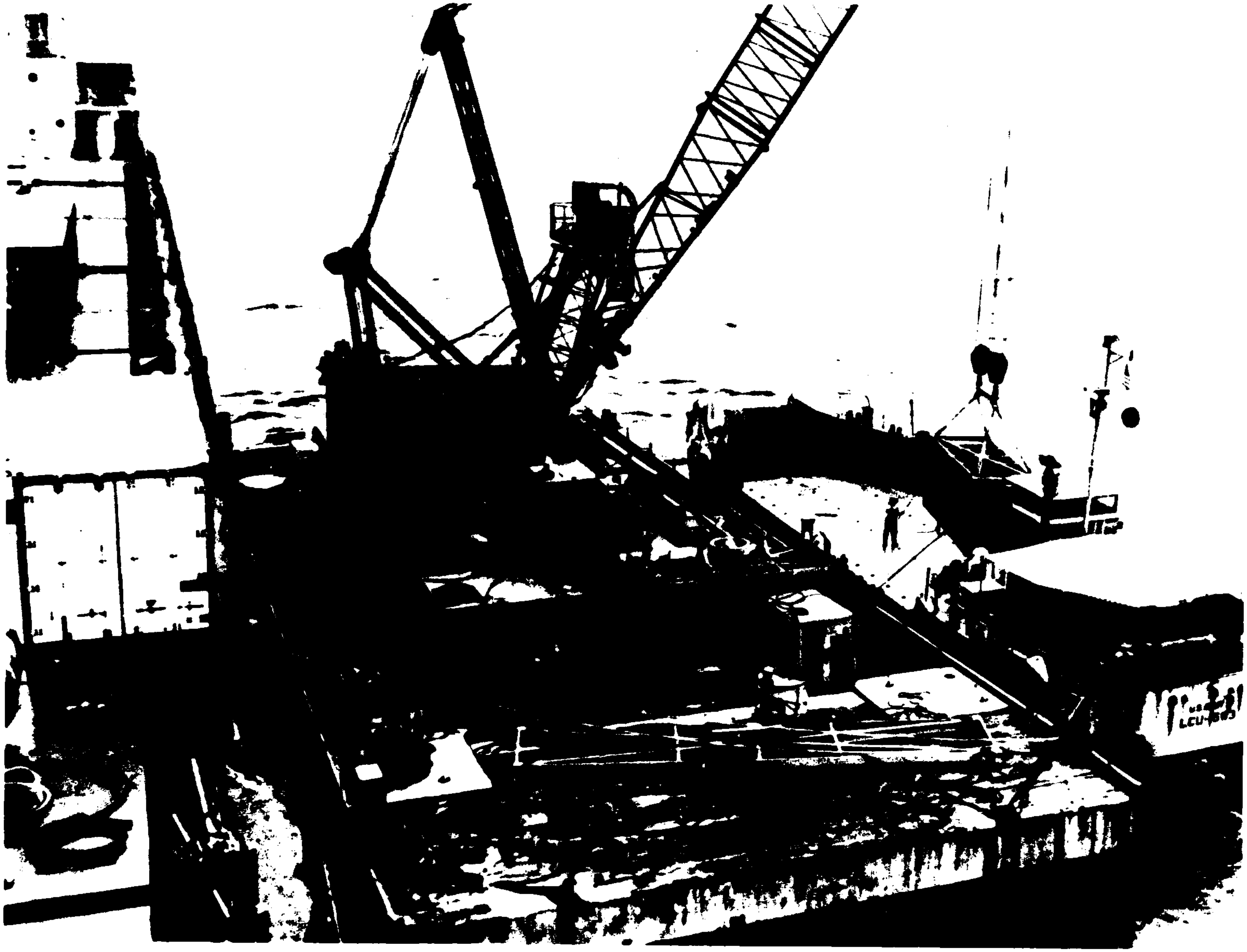


Figure 14 - Temporary Container Discharge Facility (TCDF)

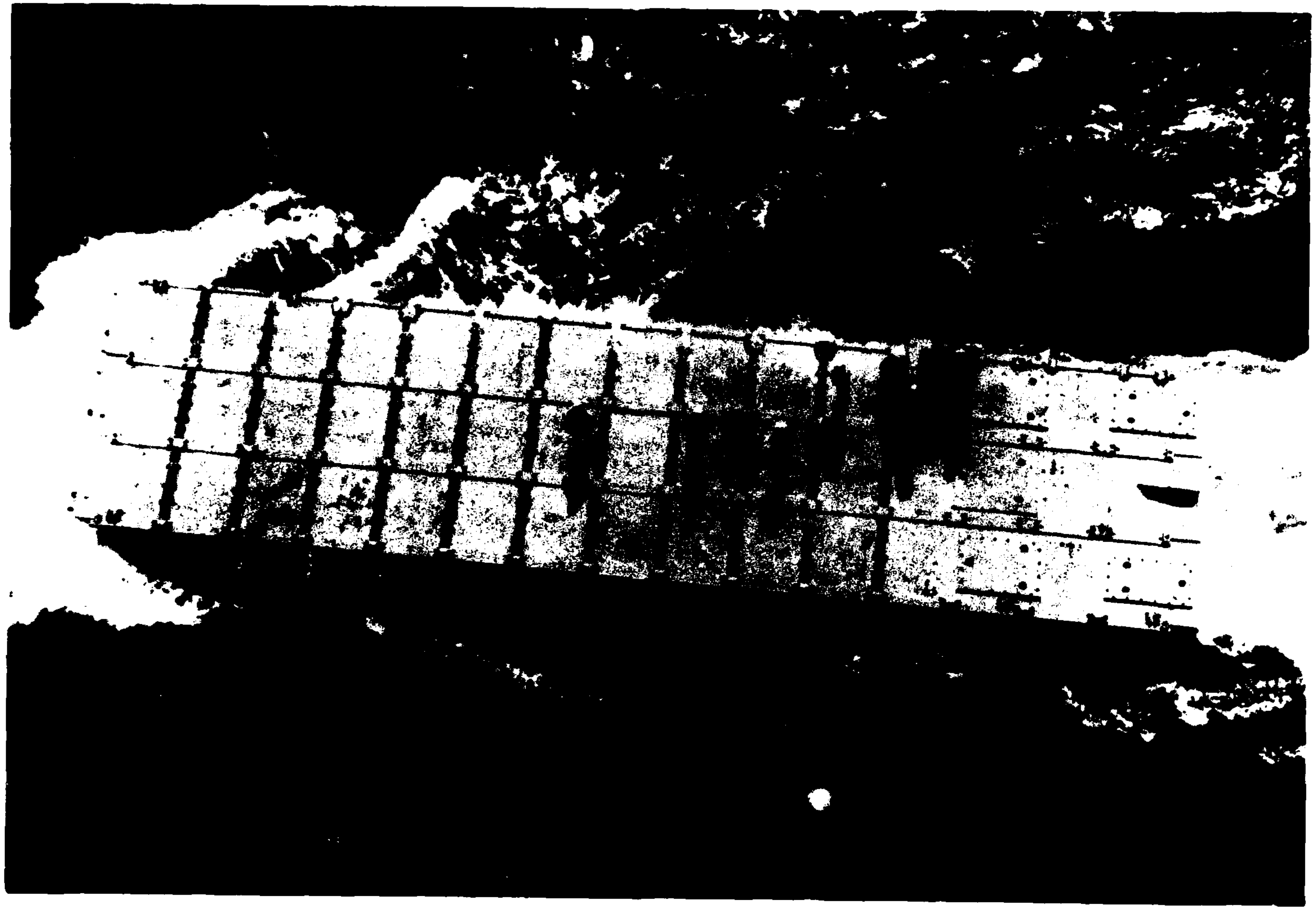


Figure 15 - Powered Causeway Section Under Way

Figure 16 - Artist Concept of Causeway Ferry

as long as the load does not exceed 70 STons. In conditions up to sea state 3, it can carry two containers with a maximum load of 40 STons. Each regular (unpowered) causeway section can carry up to 100 STons of cargo in calm seas. Therefore, the maximum load of a three-section causeway ferry is 270 STons of containerized cargo in calm seas with some reduction in load to increase freeboard as sea conditions increase. The normal operating speed of a loaded powered causeway section in calm water is eight knots and of a fully loaded three-section causeway ferry is four knots.

The warping tug configuration, Figure 17, of the powered causeway is fitted with a winch and an A-frame. Its primary uses in JLOTS II will be supporting the installation of the ELCAS, the ATTF, and assembly of the calm water drive-off facility for RO/RO ship discharge.

LACV-30

The LACV-30 is a fully amphibious craft designed to meet the US Army requirements of transporting military cargo in support of the LOTS mission. It can carry a variety of cargo configurations including containers, vehicles, and breakbulk pallets from shipside, through the surf, and onto the beach. The craft measures 76 ft by 37 ft by 29 ft (on cushion) and is propelled by two, three-bladed propellers to speeds approaching 50 knots.

During JLOTS II, the LACV-30 will carry containers onto the beach for offloading by crane. Figures 18, 19, and 20 were taken during JLOTS I and show the craft approaching the beach, on the beach, and being offloaded.

ELCAS

The ELCAS is a component of the Navy's Amphibious Logistics System (ALS). It is a portable pier, elevated above the water surface on pilings,

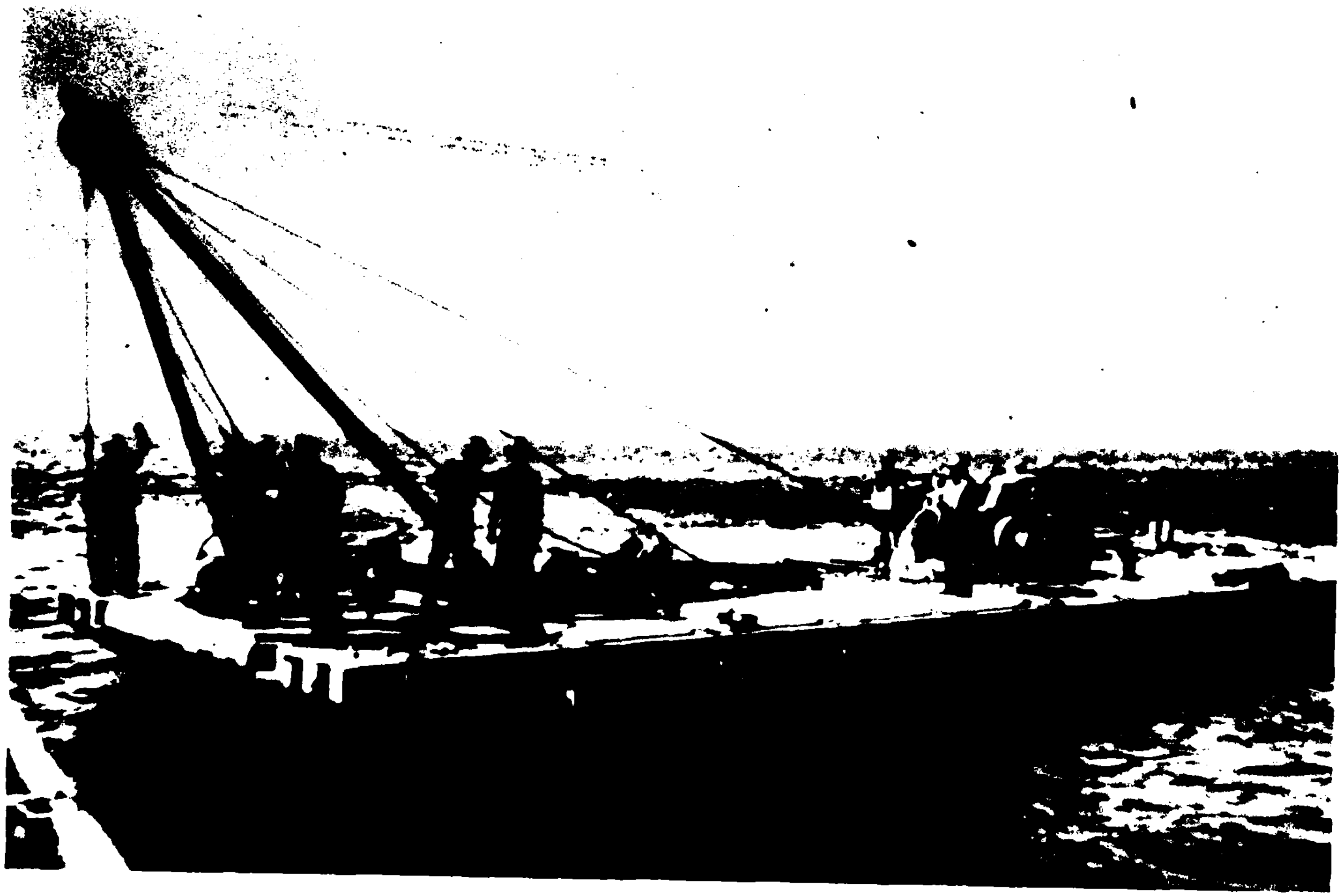


Figure 17 - Warping Tug Configuration

Figure 18 - LACV-30 Approaching Prepared Beach Area

Figure 19 - LACV-30 Maneuvering on Beach in Bermed Roadway Leading to Offloading Position

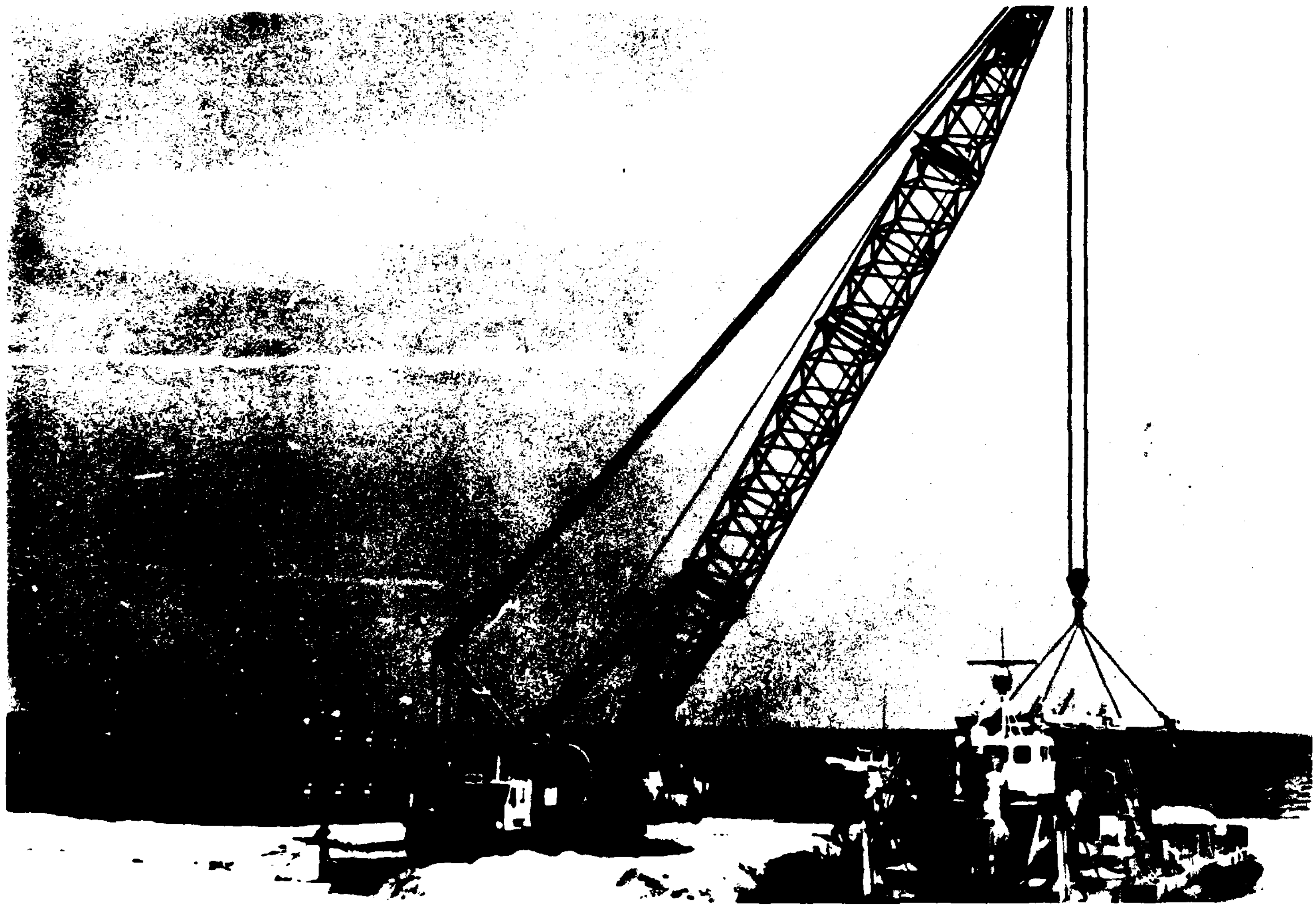


Figure 20 - LACV-30 Being Offloaded

and extending from the beach to beyond the influence of the surf zone (see Figures 21 and 22).

The ELCAS is installed in operating areas where no suitable harbor or pier facilities exist and it serves as a platform for offloading cargo from lighterage and delivering it ashore thus avoiding the hazards of transiting the surf and the potential for lighterage broaching at the beach. It has a fendered camel for tie-up of various military lighters and commercial cargo barges for offloading operations.

Navy capability to deploy, install, and operate the ELCAS will be evaluated in JLOTS II. In the Deployment Phase, representative ELCAS components will be loaded aboard a LASH ship for transit to the operating area off Fort Story and then offloaded into the water. The entire ELCAS system cannot be onloaded in the test since the limited deck space must accommodate the equipment of three Services.

The primary component of the ELCAS is the 21 ft by 90 ft causeway section. A number of these sections are connected end-to-end in the water and the assembly is then positioned perpendicular to the beach as shown in Figure 23.

The pierhead of the ELCAS (seaward end) is two causeway sections wide by three causeway sections long to provide room for a 140-ton crane to offload containers from lighterage tied alongside and load them onto trucks for transit to the beach and on to the marshaling area. The end-most causeway section is fitted with an air-bearing turntable for reversing the truck direction prior to loading it with a container. Since the ELCAS can accommodate two-way traffic, empty trucks can be positioned to move into the loading spot upon departure of the loaded truck.

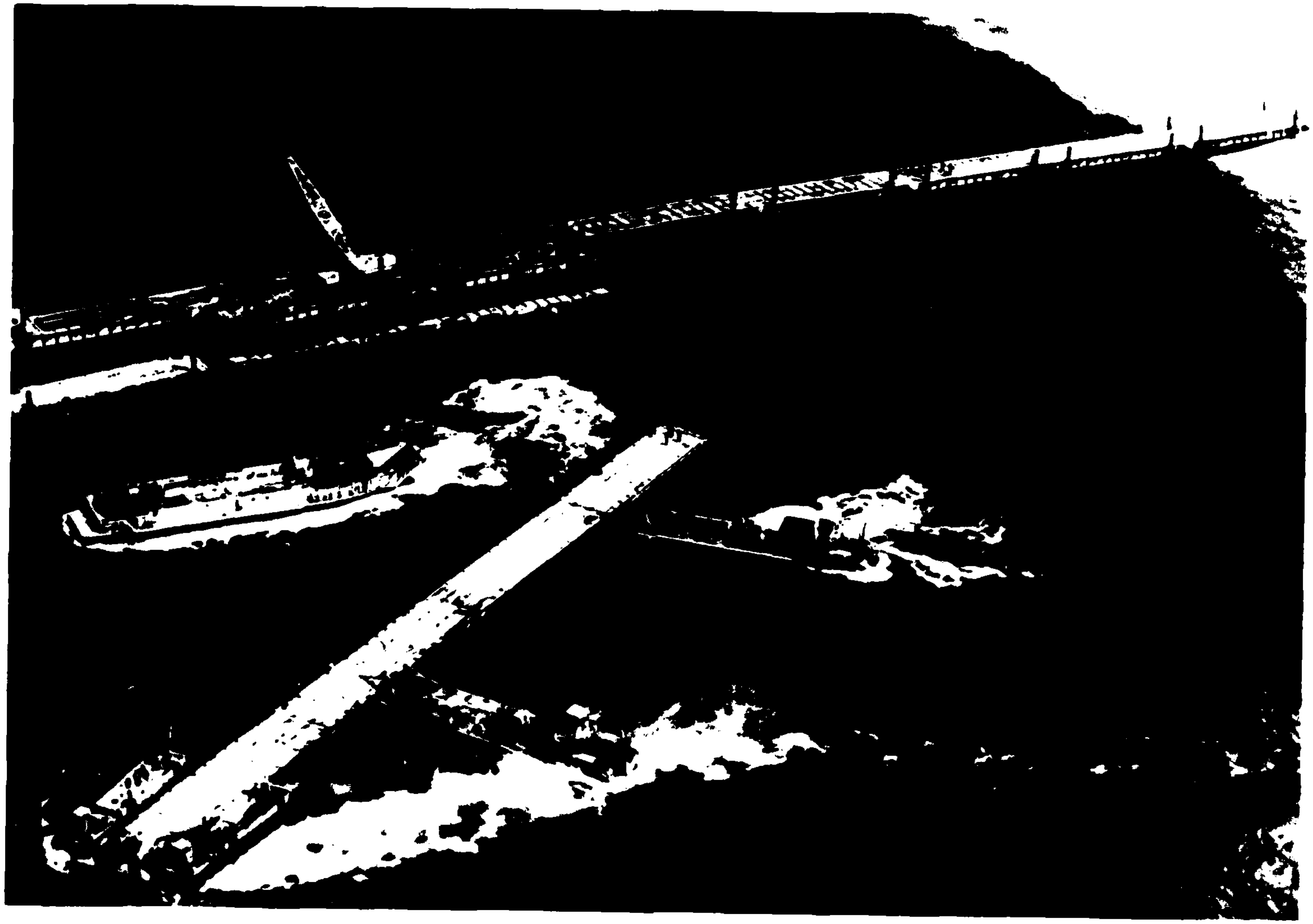


Figure 21 - ELCAS Exending from the Beach to Beyond the Surf Zone

Figure 22 - LCU Being Offloaded Alongside ELCAS

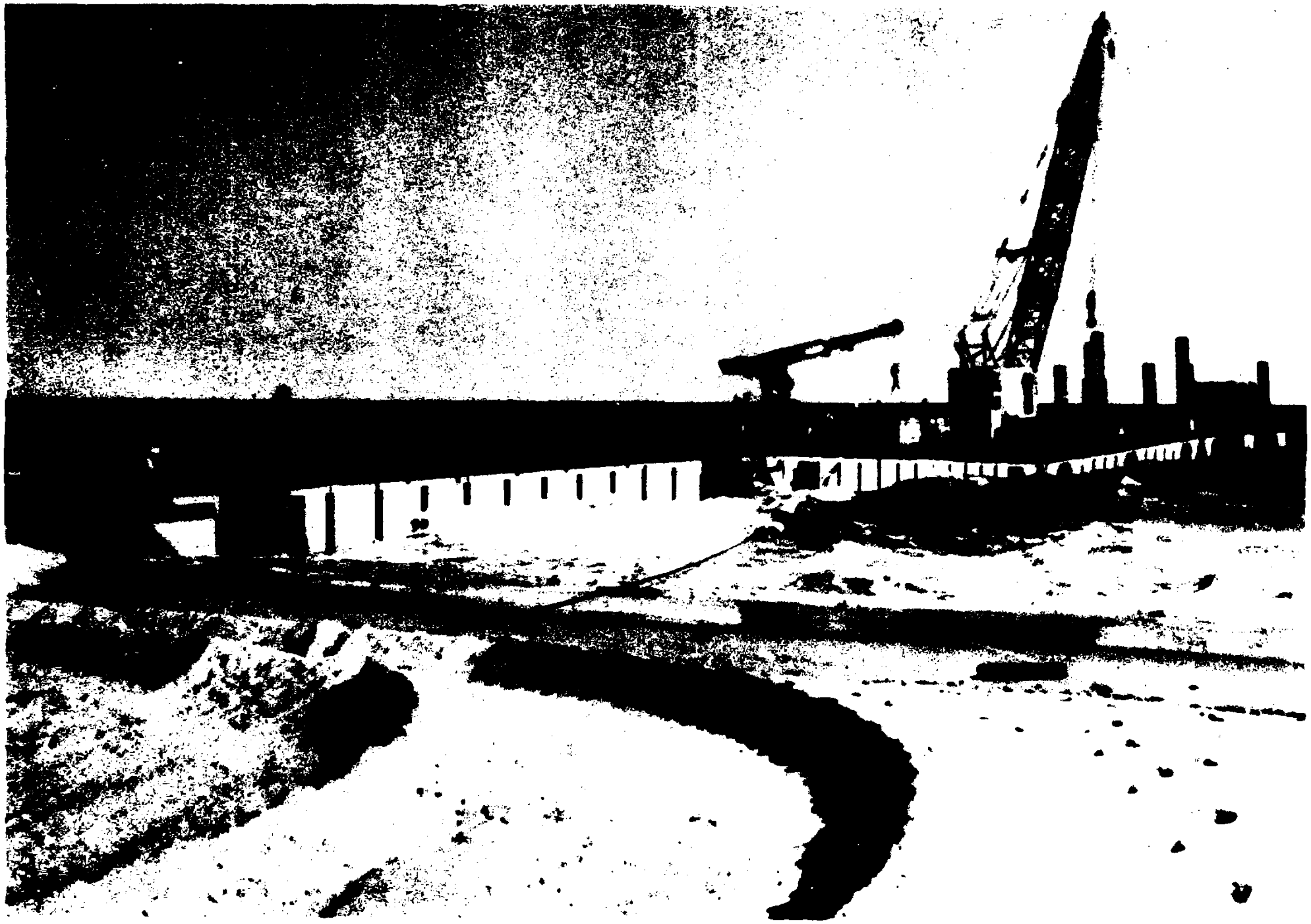


Figure 23 - ELCAS Being Erected

ELCAS installation time is estimated to be about 72 hours with 70% of the man-hour requirements consumed in pile driving and elevating tasks. Three warping tugs are required to install the system.

The ELCAS maximum sustained throughput rate is approximately 240 containers per 20-hour day. Mixed cargo operations (i.e., containers and breakbulk) have a lower throughput efficiency because of the need to change lifting fixtures to accommodate various load configurations.

DeLong Pier ("A" Section)

The Army's "A" DeLong Pier is a 300 ft by 80 ft by 13 ft 1700 STon steel barge which is elevated on a series of ten 6 ft diameter piles, jacked down through spudwells and into the sand. The pier must be connected to the beach by bridging ramps which provide access for trucks during cargo offloading operations as shown in Figures 24 and 25. The barge must be towed to the operating area since it is too large for existing sealift capabilities. Multiple sections can be linked to form a pier to which deep draft shipping can be moored for direct pier-side discharge operations.

Offload operations are performed by mobile cranes lifting containers out of lighterage moored to the end of the pier. The containers are deposited on chassis which are towed across the pier to the beach.

The primary constraints of the "A" DeLong barge are that its tow speed is limited to 5 knots, and it is structurally inadequate for safe ocean tow with mobile cranes onboard. Thus the crane must be separately transported to the operating area and installed aboard the pier after it is in place.

During JLOTS II, the DeLong Pier will be erected several hundred yards down the beach from the Navy ELCAS and will share Army throughput traffic with the amphibian discharge crane (the facility to lift containers from amphibians such as LACV-30 and LARC-LX).

Figure 24 -- DeLong Pier Installation in JLOTS I

Figure 25- "A" DeLong Pier Supporting Container Offloading Operations

LACH

The LACH is a two-wheeled, straddle lift, hydraulically operated container handling device developed by the USMC for offloading 20-ft containers from beached lighterage. For propulsion, it is typically hitched to the front of a bulldozer such as a crawler-tractor model 8232.

The LACH is pushed into the lighter (LCUs, LCM-8s, and causeway ferries) where it straddles a container and lifts it with a hydraulically operated spreader bar as shown in Figure 26. The LACH can either deposit the container on the beach for further handling by other equipment or it can deposit the container onto a trailer, Figure 27, for transit to the marshaling yard. The maximum container offloading rate for any single LACH is 120 containers per day or ten minutes per container. This includes delays of retracting the empty lighter and beaching the next loaded lighter.

The LACH can be deployed on commercial or Navy ships and transferred to the beach in a landing craft. LACH characteristics are listed below:

Payload: 50,000 pounds	Height: 19 ft (travel mode, 10 ft)
Weight: 40,000 pounds	Width: 13.2 ft
Length: 35 ft	

Operating personnel include:

1 hydraulic lift operator

1 spreader frame operator, or

2 spreader bar hook operators

BULK FUEL SYSTEMS

Because of the increasing size of commercial tankers, the older military ship-to-shore bulk fuel systems cannot reach the more distant anchorages of these deep draft ships or provide the volumes to meet the increasing demands for bulk fuel ashore. Marine Amphibious Force (MAF)

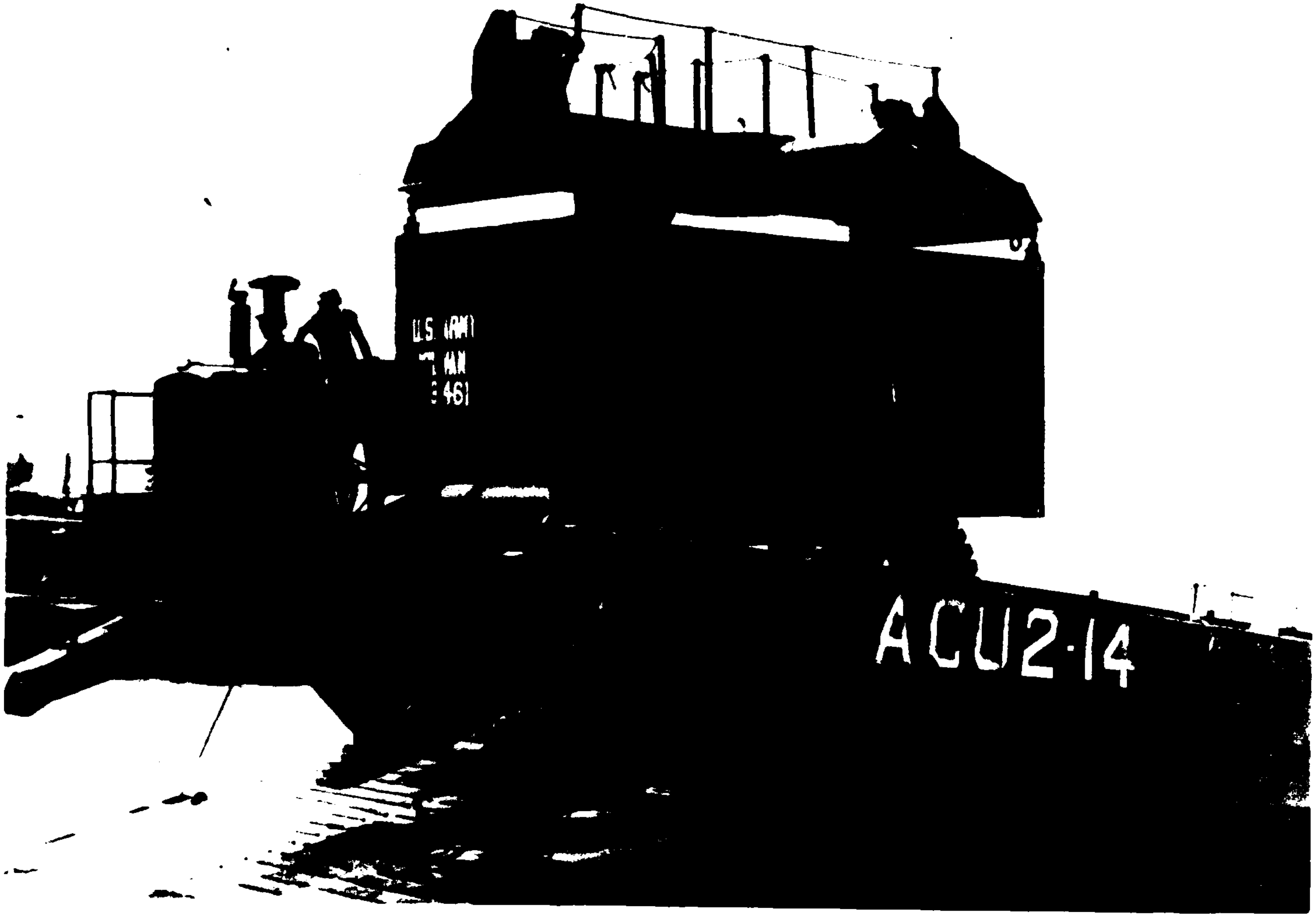


Figure 26 - LACH Extracting Container from Beached LCM-8

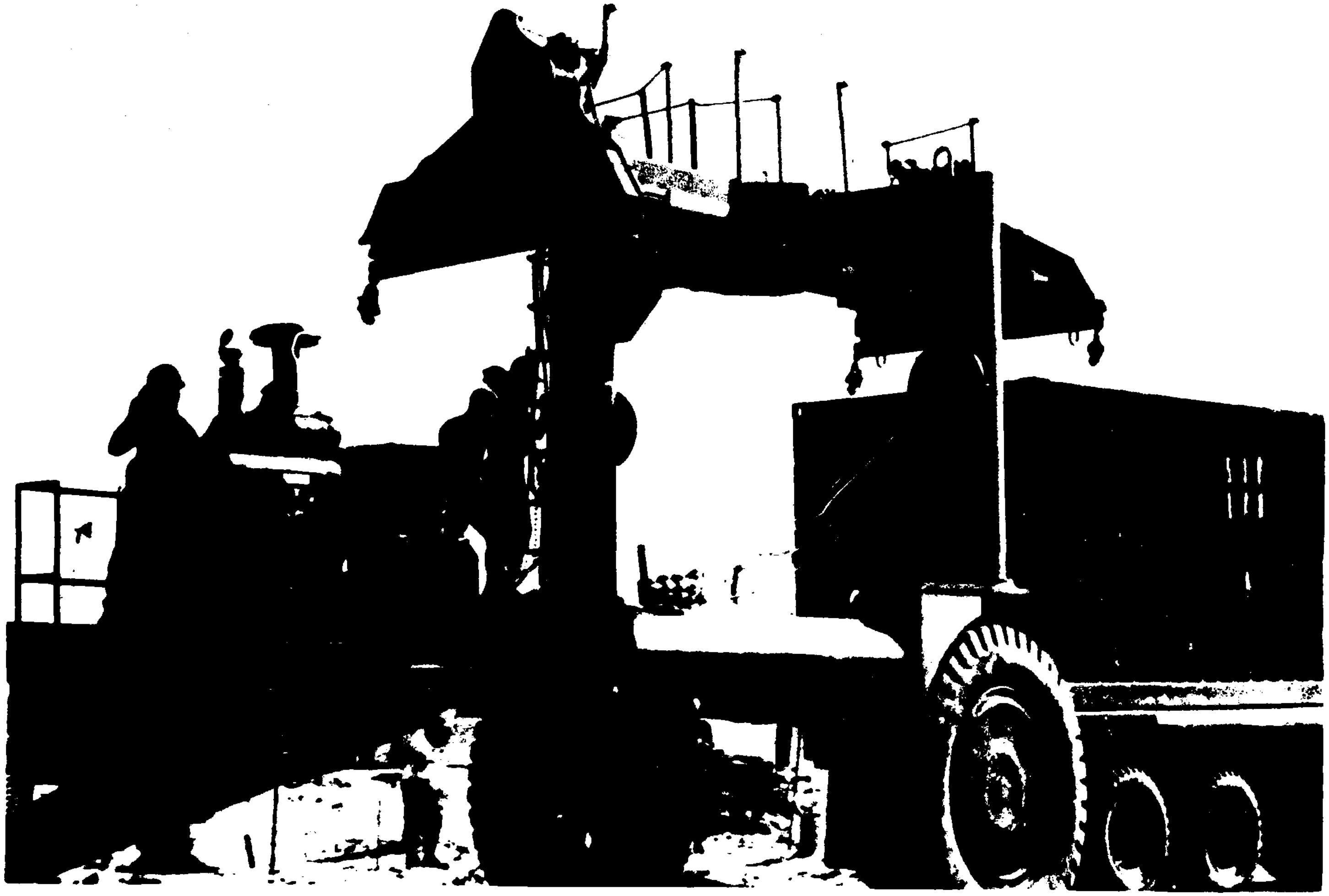


Figure 27 - LACH Depositing Container on Truck Chassis

requirements are estimated to be 500,000 gallons per day by D+7 and 1.5 million gallons per day by D+12. To meet these requirements, a temporary fuel transfer system must be installed until a longer, more permanent, bottom-laid system is completed. The Navy temporary system is the Amphibious Assault Fuel Supply Facility (AAFSF) and the more permanent system is the Amphibious Tanker Terminal Facility (ATTF). The Marine Corps land-based fuel storage system is called the Amphibious Assault Fuel System (AAFS) and is compatible with the Navy's ship-to-shore systems. The Tactical Marine Petroleum Terminal (TMPT) is the Army's transfer and storage system for over-the-shore movement of bulk fuel into the theater of operations.

AAFSF. As described in "Initial Definition Amphibious Logistic System (ALS)," March 1981, prepared for the Naval Facilities Command, the installation of the Navy AAFSF is usually performed in two phases. The first phase transfers fuel from Tank Landing Ships (LSTs) through 6-inch floating hoses, the primary component of temporary system known as the Amphibious Assault Bulk Fuel System (AABFS). After the LSTs have been off-loaded, the 6-inch hoses are shifted to 135,000 gallon capacity Dracone floating bladders. It is this second phase of the AAFSF which will be tested during JLOTS II.

Conversion of the AABFS to accommodate the Dracone fuel bladders of the AAFSF requires establishing mooring anchors, installing a floating pump and power cable, attaching the hose line, and positioning generators ashore. This operation is designed to take about ten hours under ideal conditions and about twice as long when conditions approach sea state 3. Although the system can be rigged in conditions up to sea state 3, pumping operations are currently restricted to sea state 1. Means must also be provided to tow the bladders to and from fuel-supplying deep water tankers.

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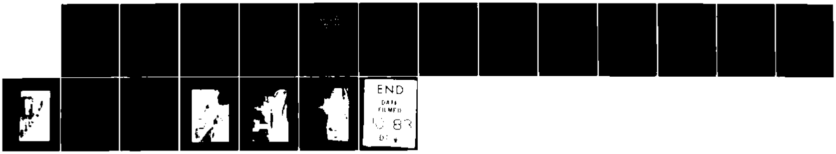

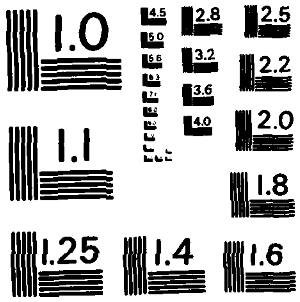
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Figure 28 illustrates the lay-out of the AAFSF system. The pumps are rated at 700 gallon per minute capacity when pumping through 2500 ft of hoses and the system can effectively extract about 110,000 gallons of the 135,000 gallon capacity Dracones.

ATTF. ATTF consists of two 8-inch pipelines and a single point mooring (SPM) buoy. The two bottom-laid 8-inch pipelines, each approximately 10,000 ft long, connect the SPM buoy to the beach. The SPM buoy is designed for water depths of 65 to 200 ft and is capable of accommodating a 70,000 ton deadweight tanker in conditions through state 4 seas. The total delivery capacity of the ATTF through the two lines is 800 gallons per minute. Figure 29 illustrates the system.

A considerable amount of equipment is required for ATTF installation; for example, warping tugs, pipe tongs, pipeline sections, tractor-trailers for hauling pipes onto the beach, air compressors, hoses, anchor chains, and anchors. Ship offloading of this equipment must begin at least a day before the scheduled start of ATTF installation.

Installation of the ATTF is a major project consisting of four principal installation tasks. Table 11 shows the estimated time and personnel required to install an ATTF. Installation time is estimated to be approximately 17 days, working daylight shifts only.

AAFS. From the highwater mark on the beach, the Marine Corps AAFS is installed and operated by the Bulk Fuel Company of the Engineering Support Battalion. Each AAFS has five tank farm assemblies (see Figure 30) each with a storage capacity of 120,000 gallons. The tank assemblies consist of six 20,000 gallon fabric tanks. Another 120,000 gallons may be stored in the fabric tanks located at the booster station, giving each tank farm assembly a total capacity of 720,000 gallons. There are eight systems per company, with two companies per MAF, resulting in a total bulk fuel storage

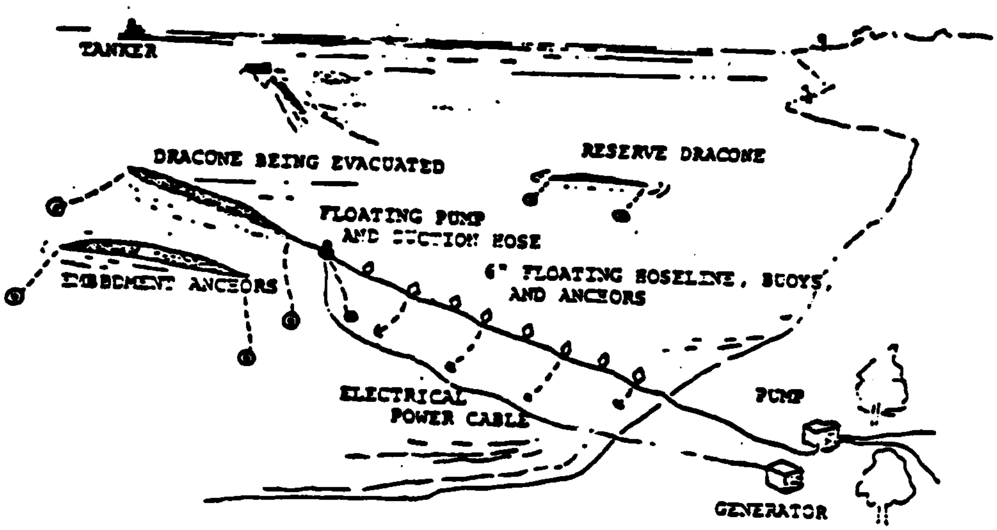


Figure 28 - Amphibious Assault Fuel Supply System (AAFSF)

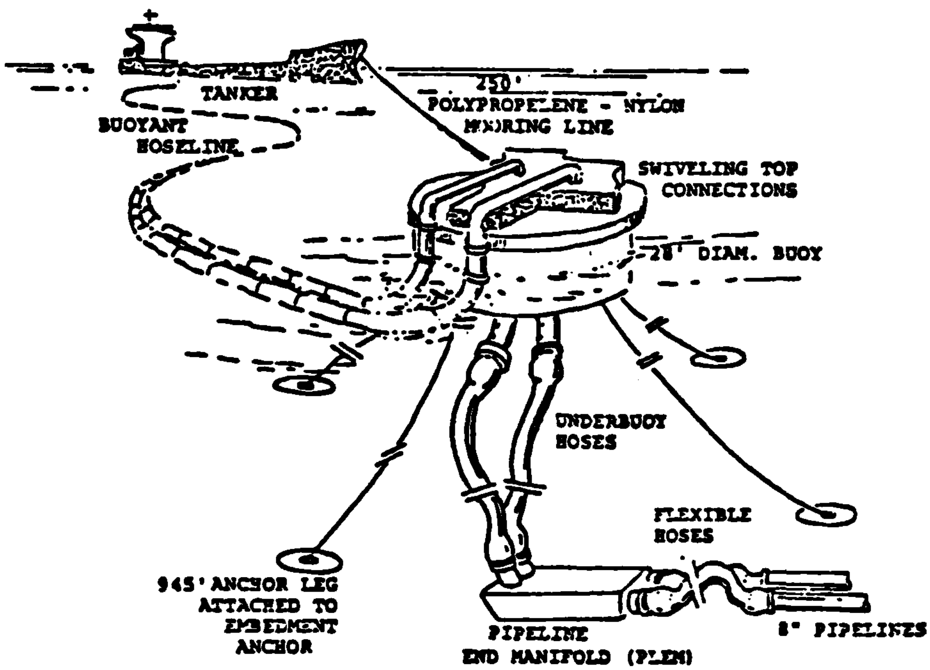
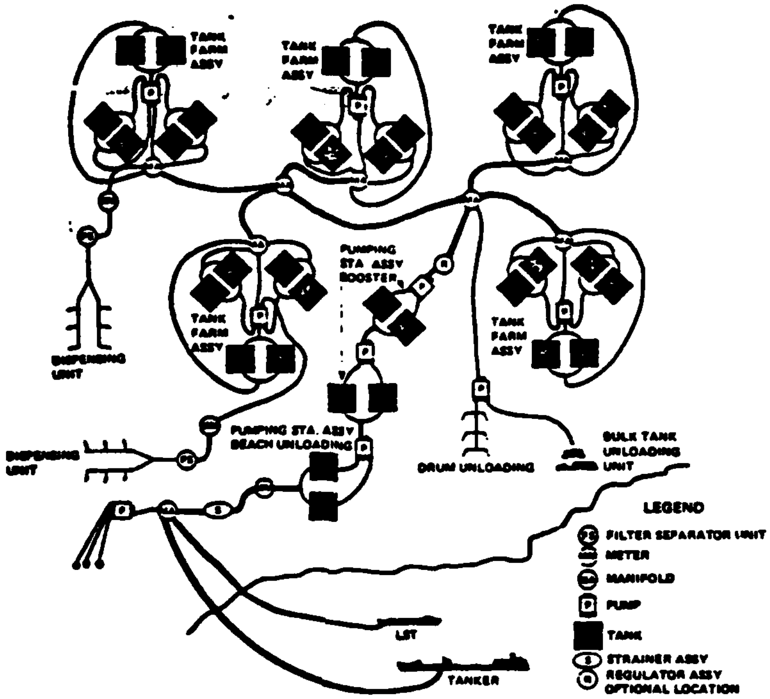


Figure 29 - Single Point Mooring Buoy (SPM)



AMPHIBIOUS ASSAULT FUEL SYSTEM

Tank farm assemblies	5	Ship distribution distance	Up to 3 mi
Storage capacity	120,000 gal per tank farm	System dispensing rate	Up to 350 gal per min
Ship-to-system rate of acceptance	600 gal per min	No. of dispensing stations	2
		No. of outlets per station	6

Figure 30 - Amphibious Assault Fuel System (AAFS)

TABLE 10 - INSTALLATION TASKS, TIME, AND PERSONNEL FOR 8-INCH ATTF

Task	Estimated Time (days)	Estimated Personnel	Est Lighter Support*
Site Survey	1	13	1 Warping Tug
Place drag-embedded anchors	4	59	3 Warping Tugs 2 Causeway Sections
Assemble bottom-laid pipeline	9	68	3 Warping Tugs
Set SPM buoy	3	41	2 Warping Tugs

* Lighterage requirements will depend upon time required for specific tasks and concurrent installations. Delays could increase warping tug requirements.

capacity of approximately eleven million gallons per MAF. For the purpose of JLOTS II, only one system will be tested.

TMPT. The Army TMPT consists of offshore and onshore portions. The offshore portion is installed by a platoon (approximately 40 troops) from an Engineering Port Construction Company (TOE 5-129). The onshore portion of the TMPT is installed by a Petroleum Pipeline and Terminal Operating Company (TOE 10-207). This Company of approximately 150 troops is responsible for operating the entire system. It administratively operates under the Petroleum Pipeline and Terminal Operating Battalion (TOE 10-206) which reports to a Petroleum Group (TOE 10-202).

The TMPT has a 50,000 barrel (2.1 million gallon) onshore storage capacity. The storage system is dispersed over a 160-acre area and is connected to a multi-leg tanker mooring system by parallel, 6-inch, 5000 ft lines; one is a bottom-laid pipeline and the other is floating hoseline. Figure 31 is a sketch of the TMPT system showing the following components:

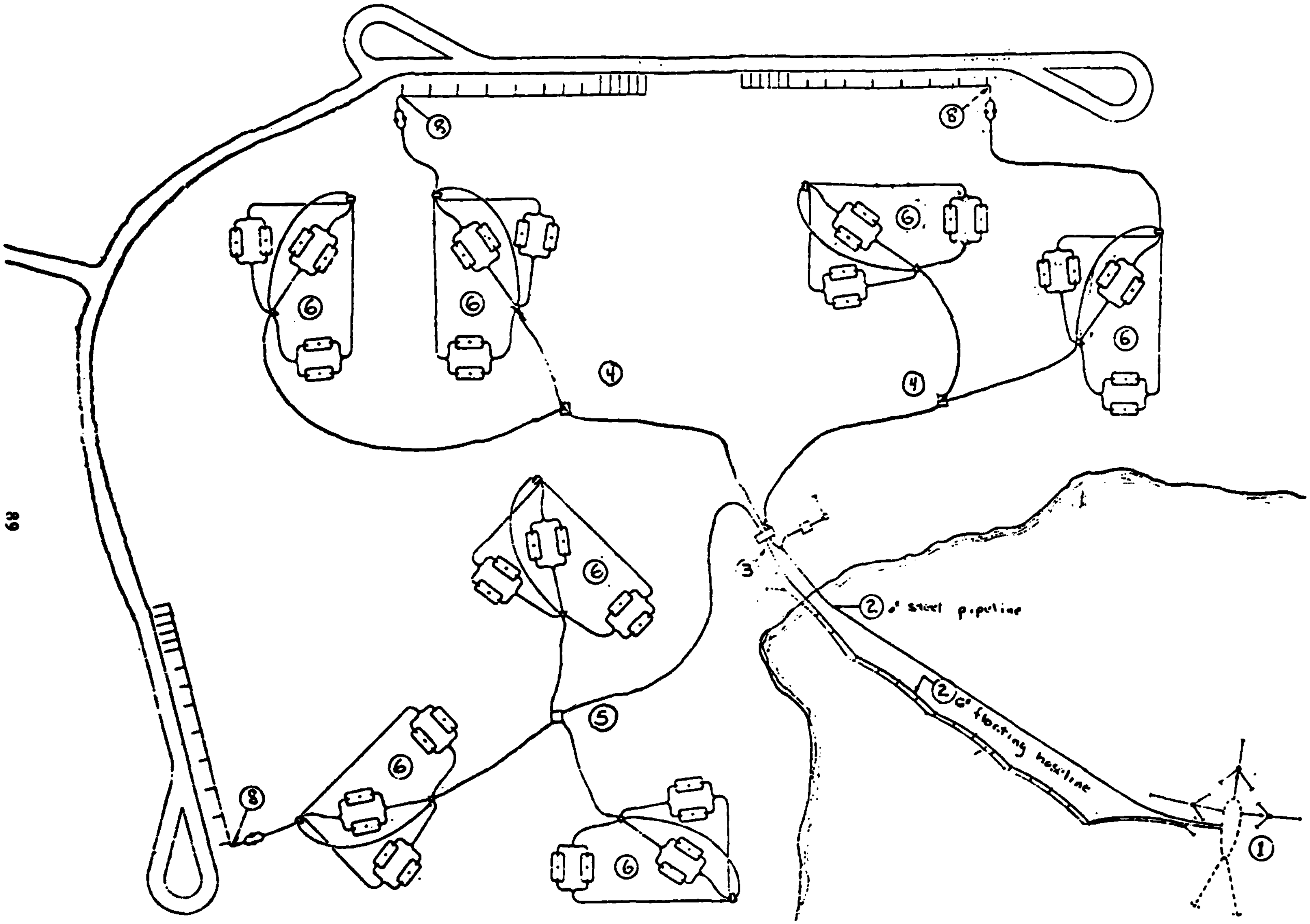


Figure 31 - Tactical Marine Petroleum Terminal (TMPT) System

(NOT TO SCALE)

(1) a multi-leg tanker mooring system; (2) offshore steel pipeline and floating hoseline systems; (3) a 600-gallon per minute pump station assembly; (4) two hoseline distribution"A" assemblies; (5) one hoseline distribution "B"assembly; (6) seven 300,000 gallon capacity fuel tank module assemblies, each comprised of six 50,000 gallon collapsible storage tanks; (7) seven mobile fire-fighting systems (not shown), one per fuel tank assembly module; and (8) three fuel dispensing assemblies.

The Army goal is to have the system fully operational within 72 hours. This goal is achievable for the onshore portion, but weather conditions might delay installation of the system offshore. The Army is planning operational tests which will identify the installation time for the offshore portion prior to the JLOTS II tests at Fort Story. Currently, there is no estimate on how long the offshore installation will require.

Barge Mounted Reverse Osmosis Water Purification Unit (ROWPU)

The Army is developing this system to facilitate movement of their water purification units. The system consists of two ROWPU's mounted on an Army M231A Dry Cargo Barge. Each ROWPU is capable of producing 150,000 gallons per day of potable water from sea water. If available by the fourth quarter of Fiscal Year 84, a prototype system will be installed off of Fort Story during Phase III.

Operationally, the barge is maneuvered to an anchorage by a powered water craft and is then connected to a shoreside water storage facility via a bottom-laid pipeline. It can produce at full capacity through pipeline up to 10,000 feet long and is designed to operate in sea state 3 conditions. The system is manned by a seven man water purification team and two marine enginemen.

Department of the Army Standard Port System (DASPS)

DASPS is an Army-standard system that automates the function of ocean

port cargo documentation and accountability. It was developed in 1972-73 and adopted in 1974 for worldwide use as an Army-standard system for Army OCONUS terminals. The Seventh Transportation Group at Fort Eustis, Virginia is a DASPS user by virtue of its contingency role as a water terminal operator.

In 1978, the Army initiated an upgrading of the system in order to overcome the following deficiencies: lack of system's mobility (all installations are in a fixed-site mode with local work forces), inability to meet expected wartime peak loads, and obsolescence of automated data processing equipment (system operates on an RCA Spectra 70/15 of early 1960s design and manufacture). The upgrading action currently underway has resulted in the development of an enhanced system entitled DASPS-E, with the E standing for enhanced.

DASPS-E is a total redesign of DASPS. The system will utilize mobile Army data processing equipment known as the DAS3 Model B, which is a Honeywell level 6/47 minicomputer in a van-mounted configuration. The intended staffing is military, for mobility purposes, and it includes maintenance personnel for the automated data processing equipment. Routine transaction input/output operators can be either Army or local nationals. The system also includes the required vehicles, generators, and climate control equipment.

Sand Grid Roadway

A new technique for soil stabilization is being tested and developed by the U. S. Army Corps of Engineers. This technique involves the use of plastic "honey comb" grid systems (8' wide x 20" long x 8" deep) to confine loose soil such as sand which, with a minimum of personnel and equipment resources, produces a sturdy roadbed. A surfacing material (e.g. asphalt)

is then applied to the emplaced grid system roadbed, thus providing a roadway surface capable of withstanding continuous wheeled vehicle use.

APPENDIX A

SHIP CHARTERS

SHIPS CHARTERS*

Since MSC is the only organization authorized to procure shipping services for DOD and its components, it should be involved in the early phases of the planning process. Early involvement will allow identification of unusual or high-risk charter requirements, or other specific JLOTS II needs that differ from customary cargo operations. Typical MSC data needs are:

1. Operations

   a. Sequence of events

      (1) particulars of each event

      (2) proposed time-phasing of events

   b. Desired ship types

      (1) minimum ship capabilities required

      (2) ship modifications and impact on normal operations

2. Test time-frame

   a. Dates for ship involvement (window)

   b. Minimum duration of ship availability required to meet test objectives, including time for:

      (1) delivery and redelivery of ship at designated port

      (2) ship modifications

3. Other pertinent specifics

   a. known or possible risks to ship

   b. Types and amounts of cargo and/or special equipment to be lifted, transported, and stowed by the ship.

*MSC Pamphlet 3300, Dec 1977, "Chartering of Ships for Sealift Exercises and "Tests"

c. Whether a Government or commercial terminal will be used and who will be responsible for arranging for stevedoring services.

4. Funding constraints

a. Funding time factors (e.g., Will funding authority expire as of some specific date?)

b. Amount of funds available

c. MSC must provide up-to-date per diem cost estimates for each specific ship.

Once charter discussions begin, the generalized MSC requirements listed above will become more specific as the particulars of the test are discussed. Past tests indicate the need to specify requirements for a wide range of shipboard support for test personnel; e.g., head service, office space, food service, and lounge privileges.

The JLOTS II test will require the acquisition of several types of ships, including a tanker, breakbulk, and containership. Ships with specific military applications and interest for JLOTS II include LASH, SEABEE, and RO/RO. A brief description of the latter three follows.

LASH

The LASH is a lighter transporting ship with a limited container capacity. Accommodation and navigation facilities are located in the forebody, providing lighter storage and access to the stern by the 500 STon gantry crane. The stern area is where lighters are loaded aboard or discharged from the ship. A typical LASH is shown in Figure A-1. The characteristics of the various LASH ships are shown in Table A-1.

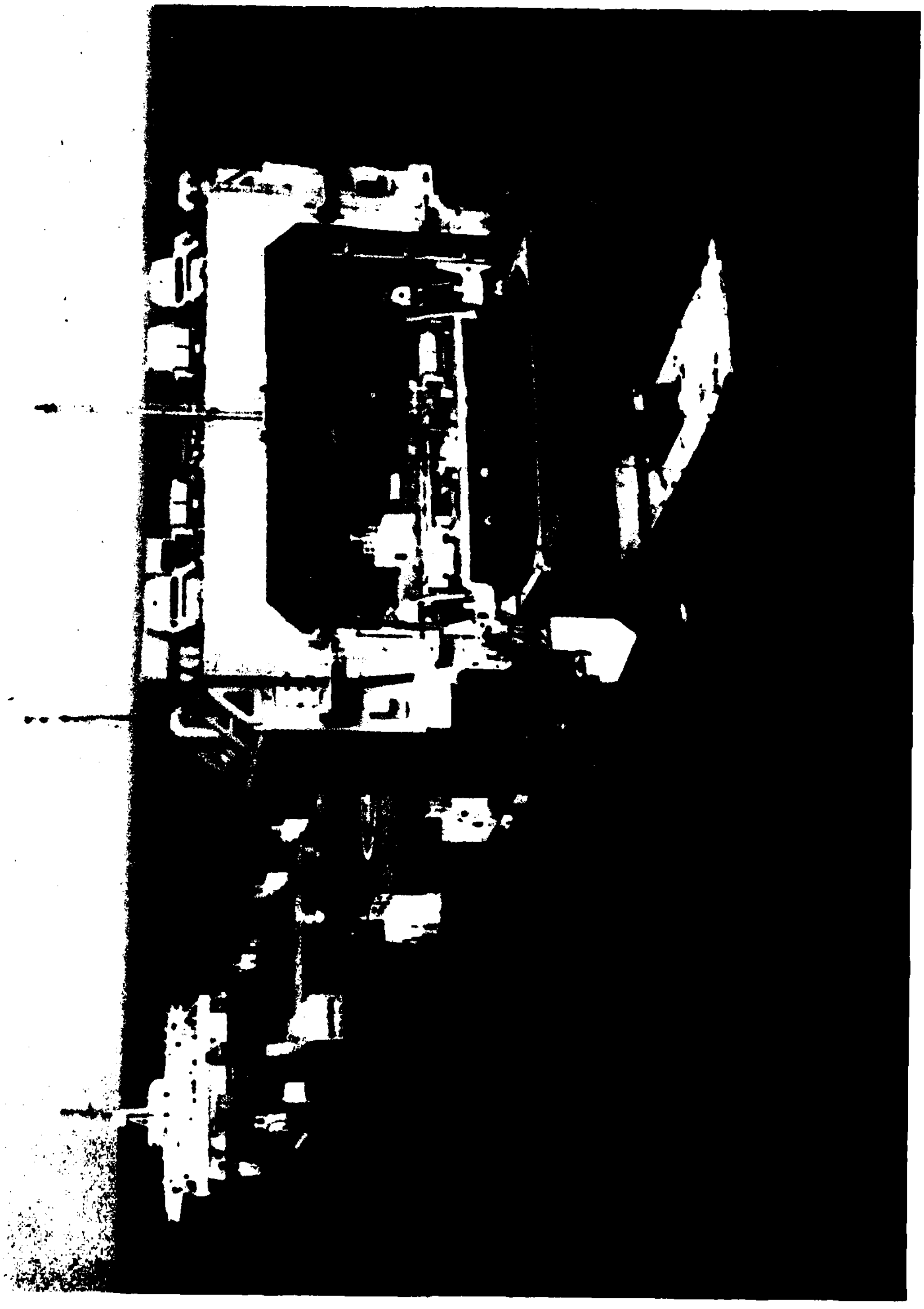


Figure A-1 - Lighter Aboard Ship (LASH)

TABLE A-I LASH AND SEABEE SHIP CHARACTERISTICS

SHIP CHARACTERISTICS		LASH				SEABEE
		C-8-S-81b	C8-S-81h	C9-S-81d	C9-S-81f	C8-S-82a
Length Overall	(ft.)	820	820	893	845	874
Beam	(ft.)	100	100	100	100	106
Draft	(ft.)	35	41	38	38	39
Displacement	(LT)	44,606	54,350	57,150	56,844	57,290
Deadweight	(LT)	29,820	39,277	40,400	40,311	38,410
Speed	(Knots)	22.5	22.5	22	22	20
Fuel Oil	(LT)	5,344	5,413	5,843	7,358	6,265
Fresh Water	(Cu. Ft.)	28,512	28,512	30,708	30,620	25,020
Bale	(Cu. Ft.)	1,306,200	1,786,600	1,752,800	1,744,400	1,774,000
Barges		49	46	89	80	38
Containers	Above Deck	130	420	108	609	-
	Below Deck	180	468	180	56	-

SEABEE

In contrast to the single deck design of the LASH, the SEABEE (Figure A-2 has three decks for storage of cargo barges. Barges are towed to the ship's stern and floated into position above the ship's submerged elevator. The elevator, which can lift up to 834 LTons in each barge, lifts the barge to the appropriate stowage deck. The lower decks are loaded first and unloaded last. Containers can also be stowed on the top (weather) deck, in lieu of barges, by using specially designed adapter flats.

SEABEE characteristics are listed alongside those of the LASH in Table A-1.

RO/RO

The RO/RO participation in JLOTS II consists of testing the rolling stock throughput rate from two types of ships: those with built-in stern ramps and those with side and stern ports but no ramp.

A typical stern ramp ship is shown in Figure A-3. The ship would lower its ramp onto Navy-provided causeway sections for cargo throughput operations. Figure A-4 shows a typical ship with side and stern ports. The ramp and supporting causeway sections for in-the-stream operations will be provided by the Navy.

Figure A-2 - SEABEE

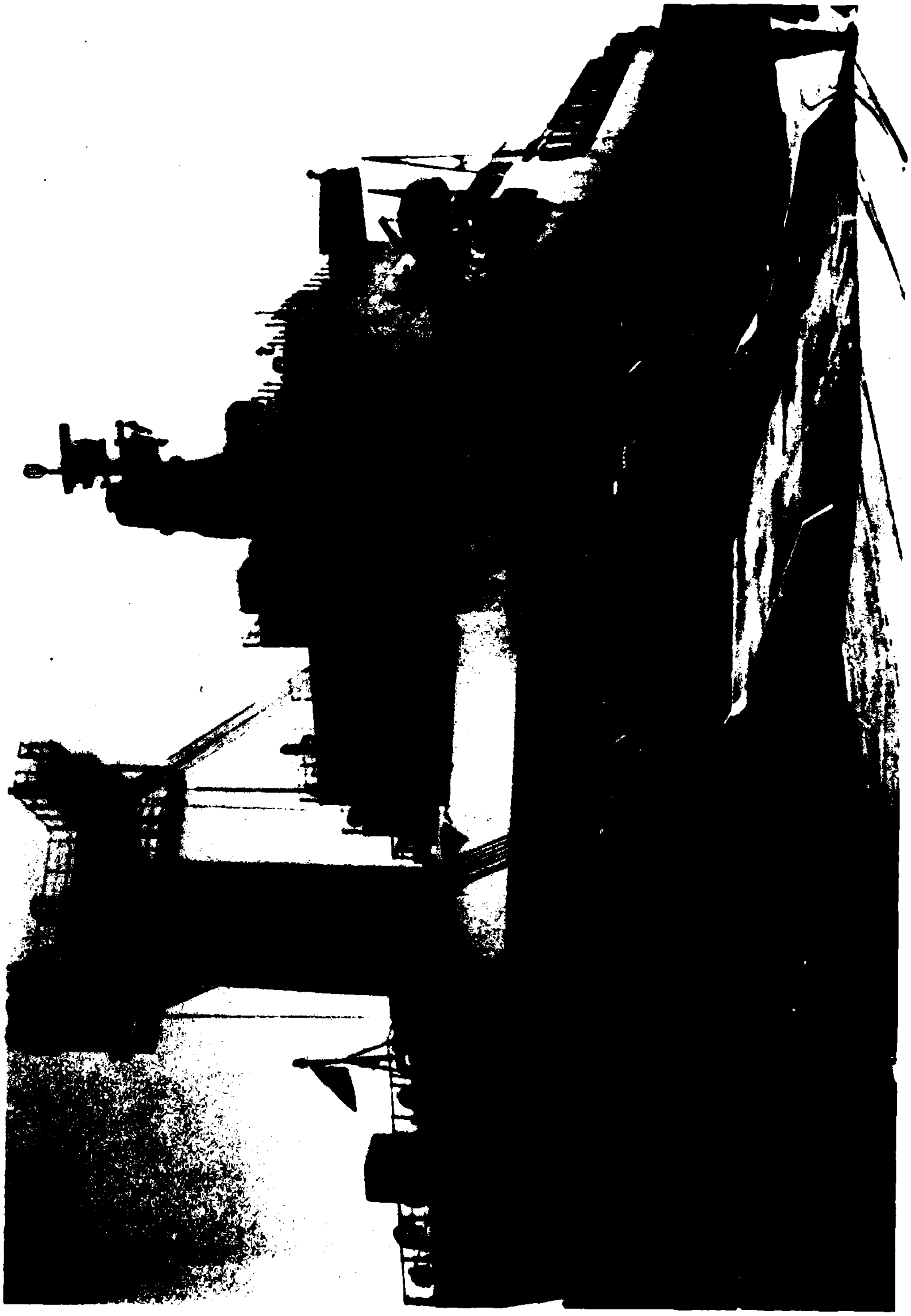


Figure A-3 - Stern Ramp RO/RO Ship

Figure A-4 - Side and Stern Port RO/RO Ship (NSS)

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